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Subject: WHO COVID-19 Models Working Group Agenda - 15th October 2020

Dear all,

Please find below the agenda for our group call that as usual will take place this Thursday Oct 15th at 3PM CET (Geneva time).

TC Link - (b)(6)

Best regards,

César, Simon and Bill

Agenda for the WHO working group on COVID-19 models

1. Lisa Chakrabarti, Institut Pasteur – "Impact of SARS-CoV-2 infection in reconstructed human airway epithelia"
2. Jacob Hou, University of North Carolina at Chapel Hill - "SARS-CoV-2 D614G Variant Exhibits Enhanced Replication ex vivo and Earlier Transmission in vivo"
3. Bobo W.Y. Mok, The University of Hong Kong – "SARS-CoV-2 spike D614G variant exhibits highly efficient replication and transmission in hamsters"

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Subject: [EXTERNAL] Agenda_WHO Advisory Group on COVID-19 Human Challenge Studies_23 Feb 2021
Attachments: 2021-02-23 Agenda WHO AG_COVID-19 HCS.pdf; 2021-02-23 Participants_WHO AG_COVID-19 HCS.pdf

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear All,

On behalf of WHO, please find attached the Agenda and list of participants for the meeting of the **WHO Advisory Group Tasked to Consider the Feasibility, Potential Value and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Healthy Young Adult Volunteers.**

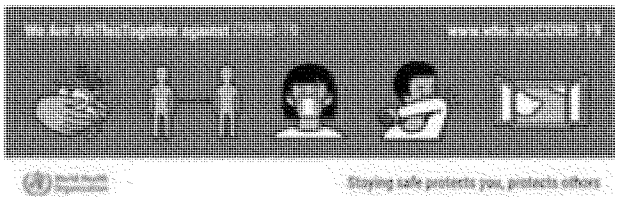
The Zoom meeting is scheduled between **13:00 – 15:30 Central European Time** (CET), **Tuesday 23 February 2021.**

We look forward to your participation.

Join Zoom Meeting
https://who.zoom.us (b)(6)
Passcode (b)(6)

Kind regards,
Fatima
(on behalf of the R&D Blueprint team)

World Health Organization



World Health Organization

WHO Advisory Group Tasked to Consider the Feasibility, Potential Value and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Healthy Young Adult Volunteers

Tuesday 23 February 2021 – via Zoom

13:00 – 15:30 CET time

Agenda

R&DBlueprint

Powering research to prevent epidemics

OBJECTIVES

- Summarizing developments since the last Advisory Group meeting;
- Update from research groups with plans for challenge models;
- Discussion on the impact of the Variants of Concern (VOC) on the possible role of volunteer challenge studies;
- Next steps

AGENDA

Time	Topic	Speakers
13:00 – 13:05	Welcoming remarks	Ana Maria Henao-Restrepo
13:05 – 13:15	Introduction and objectives of the meeting	Prof Mike Levine (Chairperson)
13:15 – 13:45	Update/summary on new COVID-19 variants meeting and research priorities	Dr Ana Maria Henao-Restrepo
13:45 – 14:00	Animal model studies to understand infectivity, transmission and vaccine induced protection of new SARS-CoV-2 variants	Dr César Muñoz-Fontela
Update on the plans, study design, challenge and expectations regarding STAGE 1 COVID-19 human challenge model developments		
14:00 – 14:15	Imperial College of Science, Technology and Medicine, hVIVO, Royal Free London NHS Foundation Trust and Vaccines Taskforce	Dr Christopher Chiu Dr Andrew Catchpole Priya Mande
14:15- 14:30	Nuffield Department of Medicine, University of Oxford	Dr Suzan Jackson
14:30 – 14:45	National Institute of Allergy and Infectious Diseases, NIH	Dr Matt Memoli
14:45 – 15:00	University of Antwerp	Prof Pierre Van Damme (TBC)
15:00 – 15:20	In-depth Q&A and discussion	Prof Mike Levine
15:20 – 15:30	Conclusions and next steps	Dr Ana Maria Henao-Restrepo
END OF THE MEETING		

World Health Organization

WHO Advisory Group Tasked to Consider the Feasibility, Potential Value, and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Healthy Young Adult Volunteers

Tuesday 23 February 2021 – via Zoom

13:00 – 15:30 CET time

R&DBlueprint

Powering research to prevent epidemics

Participants

Advisory Group Members

Chairperson
Professor Myron Mike Levine
Center for Vaccine Development and Global Health,
University of Maryland School of Medicine,
USA

Dr Salim Abdullah (unable to attend)
Ifakara Health Institute,
Tanzania

Professor Yaseen Arabi (unable to attend)
College of Medicine,
King Saud Bin Abdulaziz University for Health Sciences, King Abdullah International Medical Research Center,
Kingdom of Saudi Arabia

Delese Mimi Darko (unable to attend)
Food and Drugs Authority,
Ghana Regulation of vaccines,
Ghana

Professor Anna Durbin
Department of International Health,
Johns Hopkins University Bloomberg School of Public Health,
USA

Dr Vicente Estrada Perez
Medical School Complutense University,
Spain

Dr Zeb Jamrozik (unable to attend)
Monash University,
Australia

Professor Peter G. Kremsner
Institute of Tropical Medicine,
University of Tübingen,
Germany

Dr Rosanna Lagos (unable to attend)
Centro para Vacunas en Desarrollo,
Chile

Dr Punnee Pitisuttithum
Vaccine Trial Centre,
Faculty of Tropical Medicine,
Mahidol University,
Thailand

Professor Stanley Plotkin
University of Pennsylvania School of Medicine,
USA

Professor Robert Sauerwein
Radboud University,
The Netherlands

Professor Zeng-li Shi
Center for Emerging Infectious Diseases,
Wuhan Institute of Virology,
China

Professor Halvor Sommerfelt
Centre for Intervention Science in Maternal and Child Health, Department of Global Public Health and Primary Care,
University of Bergen,
Norway

Professor Kanta Subbarao (unable to attend)
WHO Collaborating Centre for Reference and Research on Influenza and Department of Microbiology and Immunology,
University of Melbourne,
Australia

Dr John Treanor
Infectious Diseases Division, University of Rochester, Medical Center,
USA

Dr Sudhanshu Vrati
Regional Centre for Biotechnology,
India

Advisory Group Observers

Dr Philip Krause (unable to attend)
Deputy Director for Vaccine, FDA,
Chairperson of the Vaccines Expert Group,
USA

Dr Ana Older Aguilar
Global Health Discovery & Translational Sciences,
Bill & Melinda Gates Foundation,
USA

Shobana Balasingam,
Senior Research Advisor,
Wellcome Trust.
UK

Dr Cristina Casetti (unable to attend)
Division of Microbiology and Infectious Diseases,
National Institute of Allergy and Infectious Diseases,
NIH,
USA

Dr Christine Charman,
Human Challenge Programme,
The Vaccine Task Force,
UK

Dr Deborah King (unable to attend)
Vaccine Research Lead,
Wellcome Trust,
UK

Dr Patrick Kruger (unable to attend)
Ministry of Health,
The Netherlands

Priya Mande,
Human Challenge Programme,
The Vaccine Task Force,
UK

Dr Benien E. Vingerhoed-van Aken
Netherlands Organisation for Health Research and Development (ZonMw),
The Netherlands

Dr Charlie Weller
Vaccines Programme,
Wellcome Trust,
UK

Invited Experts

Dr Andrew Catchpole
hVIVO,
UK

Dr Marco Cavaleri
European Medicines Agency,
UK

Christine Charman
UK Government Vaccine Taskforce

Professor Wilbur Chen
University of Maryland,
USA

Dr Christopher Chiu
Imperial College of Science, Technology and Medicine,
UK

Professor Pierre Van Damme
Vaccine and Infectious Disease Institute
University of Antwerpen, Belgium

Dr Uli Fruth (unable to attend)
R&D Blueprint, WHE,
Switzerland

Dr Christine Grady
Department of Bioethics at the National Institutes of Health Clinical Center, NIH,
USA

Dr Susan Jackson
Nuffield department of medicine,
University of Oxford,
UK

Dr Sir Michael Jacobs
Royal Free London NHS Foundation Trust,
UK

Dr Marjolein Kikkert (unable to attend)
Leiden University Medical Center,
The Netherlands

Dr Robert Lambkin-Williams (unable to attend)
Department of Business, Energy and Strategy,
Government's Vaccine Taskforce,
UK

Dr Alex Mann
hVIVO,
UK

Dr. John Marshall (unable to attend)
Critical Illness and Injury Research Centre,
St Michael Hospital,
Canada

Dr Hilary Marston (unable to attend)
National Institute of Allergy and Infectious Diseases,
NIH,
USA

Dr Matthew Memoli
LID Clinical Studies Unit,
National Institute of Allergy & Infectious Diseases, NIH,
USA

Professor Helen McShane
Nuffield Department of Medicine,
University of Oxford,
UK

Professor Peter JM Openshaw
Imperial College of Science, Technology and Medicine,
UK

Professor Sir Richard Peto (unable to attend)
Nuffield Department of Population Health,
University of Oxford,
UK

Professor Andrew Pollard
University of Oxford,
UK

Professor Sandra Crouse Quinn
Maryland Center for Health Equity,
University of Maryland,
USA

Professor Meta Roestenberg (unable to attend)
Leiden University Medical Center,
The Netherlands

Professor Seema Shah
Northwestern University Medical School and
Associate Director of the Bioethics Program at Lurie
Children's Hospital,
USA

Professor Samba Sow
WHO special envoy for COVID-19 (AFRO Region),
Center for Vaccine Development,
Mali

Professor Stanley Spinola
Indiana University School of Medicine,
USA

Professor Charles Weijer
University of Western Ontario,
Canada

WHO Secretariat

Cesar Munoz Fontela, Technical Officer, R&D Blueprint, Health Emergencies Preparedness & Response

Myriam Zineb Grubo, Technical Officer, R&D Blueprint, Health Emergencies Preparedness & Response

Ana Maria Henao Restrepo, Unit Head, R&D Blueprint, Health Emergencies Preparedness & Response

Fatima Kazi, R&D Blueprint, Health Emergencies Preparedness & Response

Katherine O'Brien, Director, Immunization, Vaccines and Biologicals

Juan Soriano Ortiz, Senior Consultant, Health Care Readiness, Emergency Preparedness

Marie-Pierre Preziosi, Medical Officer, Immunization, Vaccines and Biologicals

Ximena Riveros, Technical Officer, R&D Blueprint, Health Emergencies Preparedness & Response

From: KAZI, Fatema [kazif@who.int]
Sent: 2/22/2021 3:28:10 AM
To: Levine, Myron [mlevine@som.umaryland.edu]; zlshi (zlshi@wh.iov.cn) [zlshi@wh.iov.cn]; (b)(6) @gmail.com; Yaseen Arabi (b)(6) @yahoo.com]; Mrs D.M. Darko (b)(6) @yahoo.co.uk) (b)(6) @yahoo.co.uk]; Anna P Durbin [adurbin1@jhu.edu]; Vincente Estrada [vicente.estrada@salud.madrid.org]; Zem Jamrozik [zeb.jamrozik@monash.edu]; Peter Kremsner (peter.kremsner@uni-tuebingen.de) [peter.kremsner@uni-tuebingen.de]; Rosanna Lagos (rosanna.lagos@adsl.tie.cl) [rosanna.lagos@adsl.tie.cl]; Punnee Pitisuttithum [punnee.pit@mahidol.ac.th]; Stanley Plotkin (stanley.plotkin@vaxconsult.com) [stanley.plotkin@vaxconsult.com]; robert.sauerwein@radboudumc.nl; zlshi (zlshi@wh.iov.cn) [zlshi@wh.iov.cn]; ' Halvor Sommerfelt' [halvor.sommerfelt@uib.no]; kanta.subbarao (kanta.subbarao@influenzacentre.org) [kanta.subbarao@influenzacentre.org]; 'John Treanor <John_Treanor@urmc.rochester.edu>' [john_treanor@urmc.rochester.edu]; sudhanshu vrati (vrati@rcb.res.in) [vrati@rcb.res.in]; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Anastazia.OlderAguilar@gatesfoundation.org; S.Balasingam@wellcome.org; cristina.cassetti@nih.gov; D.King@wellcome.ac.uk; pp.kruger@minvws.nl; C.Weller@wellcome.ac.uk; Benien Vingerhoed- Van Aken [Vingerhoed-VanAken@zonmw.nl]; Andrew Catchpole [a.catchpole@hvivo.com]; Cavaleri Marco (Marco.Cavaleri@ema.europa.eu) [Marco.Cavaleri@ema.europa.eu]; Charman, Christine (Vaccines Taskforce Programme) [Christine.Charman@beis.gov.uk]; wchen@som.umaryland.edu; Chiu, Christopher [c.chiu@imperial.ac.uk]; Pierre Van Damme [pierre.vandamme@uantwerpen.be]; Dr Ulrich Josef FRUTH (fruthu@bluewin.ch) [fruthu@bluewin.ch]; cgrady@nih.gov; Susan Jackson [susan.jackson@ndm.ox.ac.uk]; Jacobs, Michael [michael.jacobs@ucl.ac.uk]; M.Kikkert@lumc.nl; Rob Lambkin-Williams [rlw@virologyconsult.com]; Mande, Priya (Vaccines Taskforce Strategy Directorate) [Priya.Mande@beis.gov.uk]; a.mann@hvivo.com; John Marshall [John.Marshall@unityhealth.to]; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; Memoli, Matthew J (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d6c800214484ef9a37242c009098597-HHS-memolim]; Helen McShane [helen.mcshane@ndm.ox.ac.uk]; p.openshaw@imperial.ac.uk; Sandra Crouse Quinn [scquinn@umd.edu]; M.Roestenberg@lumc.nl; SeShah@luriechildrens.org; ssow@cvd-mali.org; Sow, Samba [ssow@medicine.umaryland.edu]; sspinola@iu.edu; cweijer@uwo.ca; DIAZ, Janet Victoria [diazj@who.int]; MUNOZ FONTELA, Cesar [munozc@who.int]; Cesar Munoz-Fontela (munoz-fontela@bnitm.de) [munoz-fontela@bnitm.de]; GRUBO, Myriam Zineb [grubom@who.int]; HENAO RESTREPO, Ana Maria [henaorestrepoa@who.int]; LITTLER, Katherine [littlerk@who.int]; O'BRIEN, Katherine [obrienk@who.int]; PREZIOSI, Marie-pierre [preziosim@who.int]; RIVEROS BALTA, Ximena [lauriex@who.int]; RODRIGUEZ HERNANDEZ, Carmen A. [rodriguezhernandezc@who.int]; RYAN, Michael J. [ryanm@who.int]; SATHIYAMOORTHY, Vaseeharan [moorthyv@who.int]; SIMÃO, Mariângela [simaom@who.int]; SWAMINATHAN, Soumya [swaminathans@who.int]
Subject: [EXTERNAL] FINAL REMINDER-WHO advisory group on COVID-19 Human Challenge Studies_Tuesday 23 February

Importance: High

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Dear All,

A reminder to join the call of the **WHO Advisory Group Tasked to Consider the Feasibility, Potential Value and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Healthy Young Adult Volunteers.**

The call will be convened on **Tuesday, 23 February 2021, 13:00 – 15:30 Central European Time (CET)**. The proposed agenda will be provided in advance.

Join Zoom Meeting
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Passcode (b)(6)

From: KAZI, Fatema
Sent: Friday, February 19, 2021 7:54 PM
To: Levine, Myron <Mlevine@som.umaryland.edu>; zlshi@wh.iov.cn; (b)(6) @gmail.com; Yaseen Arabi (b)(6) @yahoo.com>; (b)(6) @yahoo.co.uk; Anna P Durbin <adurbin1@jhu.edu>; Vincente Estrada <vicente.estrada@salud.madrid.org>; Zem Jamrozik <zeb.jamrozik@monash.edu>; Peter Kremsner (peter.kremsner@uni-tuebingen.de) <peter.kremsner@uni-tuebingen.de>; rosanna.lagos@adsl.tie.cl; punnee.pit@mahidol.ac.th; stanley.plotkin@vaxconsult.com; robert.sauerwein@radboudumc.nl; zlshi@wh.iov.cn; ' Halvor Sommerfelt' <halvor.sommerfelt@uib.no>; kanta.subbarao@influenzacentre.org; 'John Treanor <John_Treanor@urmc.rochester.edu>' <john_treanor@urmc.rochester.edu>; Vrati@rcb.res.in; philip.krause@fda.hhs.gov; Anastazia.OlderAguilar@gatesfoundation.org; S.Balasingam@wellcome.org; cristina.cassetti@nih.gov; D.King@wellcome.ac.uk; pp.kruger@minvws.nl; C.Weller@wellcome.ac.uk; Benien Vingerhoed- Van Aken <Vingerhoed-VanAken@zonmw.nl>; Andrew Catchpole <a.catchpole@hvivo.com>; marco.cavaleri@ema.europa.eu; Charman, Christine (Vaccines Taskforce Programme) <Christine.Charman@beis.gov.uk>; wchen@som.umaryland.edu; Chiu, Christopher <c.chiu@imperial.ac.uk>; Pierre Van Damme <pierre.vandamme@uantwerpen.be>; fruthu@bluewin.ch; cgrady@nih.gov; Susan Jackson <susan.jackson@ndm.ox.ac.uk>; Jacobs, Michael <michael.jacobs@ucl.ac.uk>; M.Kikkert@lumc.nl; Rob Lambkin-Williams <rlw@virologyconsult.com>; Mande, Priya (Vaccines Taskforce Strategy Directorate) <Priya.Mande@beis.gov.uk>; a.mann@hvivo.com; John Marshall <John.Marshall@unityhealth.to>; hilary.marston@nih.gov; memolim@niaid.nih.gov; Helen McShane <helen.mcshane@ndm.ox.ac.uk>; p.openshaw@imperial.ac.uk; Sandra Crouse Quinn <scquinn@umd.edu>; M.Roestenberg@lumc.nl; SeShah@luriechildrens.org; ssow@cvd-mali.org; ssow@som.umaryland.edu; sspinola@iu.edu; cweijer@uwo.ca; DIAZ, Janet Victoria <diazj@who.int>; MUNOZ FONTELA, Cesar <munozc@who.int>; Cesar Munoz-Fontela (munoz-fontela@bnitm.de) <munoz-fontela@bnitm.de>; GRUBO, Myriam Zineb <grubom@who.int>; HENAO RESTREPO, Ana Maria <henaorestrepoa@who.int>; LITTLER, Katherine <littlerk@who.int>; O'BRIEN, Katherine <obrienk@who.int>; PREZIOSI, Marie-pierre <preziosim@who.int>; RIVEROS BALTA, Ximena <lauriex@who.int>; RODRIGUEZ HERNANDEZ, Carmen A. <rodriguezhernandezc@who.int>; RYAN, Michael J. <ryanm@who.int>; SATHIYAMOORTHY, Vaseeharan <moorthyv@who.int>; SIMÃO, Mariângela <simaom@who.int>; SWAMINATHAN, Soumya <swaminathans@who.int>
Subject: REMINDER-meeting of the WHO advisory group on COVID-19 Human Challenge Studies_Tuesday 23 February

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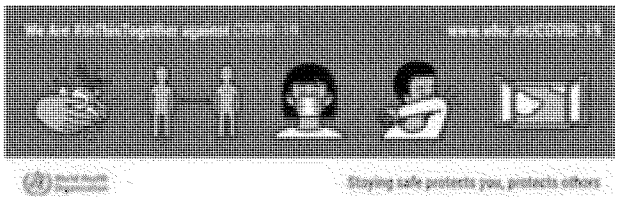
Passcode (b)(6)

We look forward to your participation.

Kind regards
Fatima Kazi, PhD MPH

R&D Blueprint
Health Emergencies and Preparedness Response (HEO)
World Health Organization
Email: fkazi@who.int
Web: www.who.int
Follow WHO on Facebook | Twitter | YouTube | Instagram



From: KAZI, Fatema [kazif@who.int]
Sent: 2/19/2021 1:54:25 PM
To: Levine, Myron [mlevine@som.umaryland.edu]; zlshi (zlshi@wh.iov.cn) [zlshi@wh.iov.cn]; (b)(6) @gmail.com; Yaseen Arabi (b)(6) @yahoo.com]; Mrs D.M. Darko (b)(6) @yahoo.co.uk) (b)(6) @yahoo.co.uk]; Anna P Durbin [adurbin1@jhu.edu]; Vincente Estrada [vicente.estrada@salud.madrid.org]; Zem Jamrozik [zeb.jamrozik@monash.edu]; Peter Kremsner (peter.kremsner@uni-tuebingen.de) [peter.kremsner@uni-tuebingen.de]; Rosanna Lagos (rosanna.lagos@adsl.tie.cl) [rosanna.lagos@adsl.tie.cl]; Punnee Pitisuttithum [punnee.pit@mahidol.ac.th]; Stanley Plotkin (stanley.plotkin@vaxconsult.com) [stanley.plotkin@vaxconsult.com]; robert.sauerwein@radboudumc.nl; zlshi (zlshi@wh.iov.cn) [zlshi@wh.iov.cn]; ' Halvor Sommerfelt' [halvor.sommerfelt@uib.no]; kanta.subbarao (kanta.subbarao@influenzacentre.org) [kanta.subbarao@influenzacentre.org]; 'John Treanor <John_Treanor@urmc.rochester.edu>' [john_treanor@urmc.rochester.edu]; sudhanshu vrati (vrati@rcb.res.in) [vrati@rcb.res.in]; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Anastazia.OlderAguilar@gatesfoundation.org; S.Balasingam@wellcome.org; cristina.cassetti@nih.gov; D.King@wellcome.ac.uk; pp.kruger@minvws.nl; C.Weller@wellcome.ac.uk; Benien Vingerhoed- Van Aken [Vingerhoed-VanAken@zonmw.nl]; Andrew Catchpole [a.catchpole@hvivo.com]; Cavaleri Marco (Marco.Cavaleri@ema.europa.eu) [Marco.Cavaleri@ema.europa.eu]; Charman, Christine (Vaccines Taskforce Programme) [Christine.Charman@beis.gov.uk]; wchen@som.umaryland.edu; Chiu, Christopher [c.chiu@imperial.ac.uk]; Pierre Van Damme [pierre.vandamme@uantwerpen.be]; Dr Ulrich Josef FRUTH (fruthu@bluewin.ch) [fruthu@bluewin.ch]; cgrady@nih.gov; Susan Jackson [susan.jackson@ndm.ox.ac.uk]; Jacobs, Michael [michael.jacobs@ucl.ac.uk]; M.Kikkert@lumc.nl; Rob Lambkin-Williams [rlw@virologyconsult.com]; Mande, Priya (Vaccines Taskforce Strategy Directorate) [Priya.Mande@beis.gov.uk]; a.mann@hvivo.com; John Marshall [John.Marshall@unityhealth.to]; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; Memoli, Matthew J (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d6c800214484ef9a37242c009098597-HHS-memolim]; Helen McShane [helen.mcshane@ndm.ox.ac.uk]; p.openshaw@imperial.ac.uk; Sandra Crouse Quinn [scquinn@umd.edu]; M.Roestenberg@lumc.nl; SeShah@luriechildrens.org; ssow@cvd-mali.org; Sow, Samba [ssow@medicine.umaryland.edu]; sspinola@iu.edu; cweijer@uwo.ca; DIAZ, Janet Victoria [diazj@who.int]; MUNOZ FONTELA, Cesar [munozc@who.int]; Cesar Munoz-Fontela (munoz-fontela@bnitm.de) [munoz-fontela@bnitm.de]; GRUBO, Myriam Zineb [grubom@who.int]; HENAO RESTREPO, Ana Maria [henaorestrepoa@who.int]; LITTLER, Katherine [littlerk@who.int]; O'BRIEN, Katherine [obrienk@who.int]; PREZIOSI, Marie-pierre [preziosim@who.int]; RIVEROS BALTA, Ximena [lauriex@who.int]; RODRIGUEZ HERNANDEZ, Carmen A. [rodriguezhernandezc@who.int]; RYAN, Michael J. [ryanm@who.int]; SATHIYAMOORTHY, Vaseeharan [moorthyv@who.int]; SIMÃO, Mariângela [simaom@who.int]; SWAMINATHAN, Soumya [swaminathans@who.int]
Subject: [EXTERNAL] REMINDER-meeting of the WHO advisory group on COVID-19 Human Challenge Studies_Tuesday 23 February

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We look forward to your participation.

Kind regards

Fatima Kazi, PhD MPH
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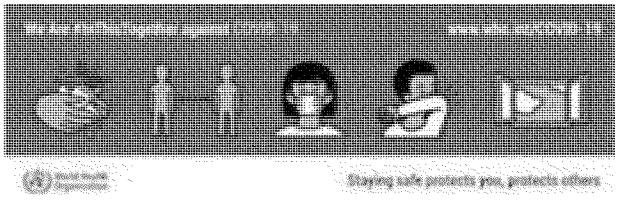

From: SCHWARTZ, Lauren [schwartzl@who.int]
Sent: 2/17/2021 3:31:47 PM
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Subject: [EXTERNAL] RE: WHO COVID-19 Animal Models Group Call

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear All,

Please find below the agenda for this week's WHO COVID-19 Animal Models group call.

Best,
Lauren – César, Simon, and Bill

Agenda WHO COVID-19 Animal Models group call Thursday February 18 3PM CET (Geneva time)

1. Andrea Marzai (NIAD) - *Rapid protection by a VSV-based vaccine against COVID-19*
2. Galit Alter (Harvard) - *Collaboration between the Fab and Fc contributions to response to emerging SARS-CoV-2 variants*

-----Original Appointment-----
From: SCHWARTZ, Lauren
Sent: Sunday, February 14, 2021 8:52 AM
To: SCHWARTZ, Lauren; Luis.Lugo.mil@afrims.org; Matthew.Reed.mil@afrims.org; franck.TOURET@univ-amu.fr; sandrine.lesellier@anses.fr; romain.volmer@envt.fr; Pearl.Bamford@health.gov.au; Jin.Zhu@health.gov.au; Ruben.Donis@hhs.gov; Karl.Erlandson@hhs.gov; Lakshmi.Jayashankar@hhs.gov; James.Little@hhs.gov; Carol.Sabourin@hhs.gov; John.Treanor@hhs.gov; sivkog@battelle.org; Russell.Ray@bcm.edu; verschoor@bprc.nl; verstrepen@bprc.nl; langermans@bprc.nl; mlewis@bioqual.com; MONALISA.CHATTERJI@gatesfoundation.org; Jacqueline.Kirchner@gatesfoundation.org; Harry.Kleanthous@gatesfoundation.org; Karen.Makar@gatesfoundation.org; David.Vaughn@gatesfoundation.org; munoz-fontela@bnitm.de; estefania.rodriguez@bnitm.de; ahgriff@bu.edu; dustin.johnson@canada.ca; sean.li@canada.ca; dean.smith@canada.ca; nax3@cdc.gov; roger.le-grand@cea.fr; pauline.maisonnasse@cea.fr; sekim@krict.re.kr; (b)(6) @hotmail.com; carolyn.clark@cepi.net; william.dowling@cepi.net; amy.c.shurtleff@cepi.net; shanchao@wh.iov.cn; (b)(6) @gmail.com; seos@cnu.ac.kr; (b)(6) @gmail.com; mto@umn.edu; mito@ciea.or.jp; tyamamoto@ciea.or.jp; mesteban@cnb.csic.es; jfgarcia@cnb.csic.es; l.enjuanes@cnb.csic.es; mopargal@rams.colostate.edu; Tony.Schountz@colostate.edu; (b)(6) @gmail.com; scordo@qb.fcen.uba.ar; (b)(6) @comcast.net; dgdiel@cornell.edu; Vasan.Vasan@csiro.au; pduprex@pitt.edu; joanne@pitt.edu; agw13@pitt.edu; AKelvin@dal.ca; renee.wegrzyn@darpa.mil; john.c.trefry.civ@mail.mil; kanta.subbarao@influenzacentre.org; REIRELAND@mail.dstl.gov.uk; MSLEVER@dstl.gov.uk; MNELSON@mail.dstl.gov.uk; JLPRIOR@dstl.gov.uk; amelia.karlsson@duke.edu; danielle.anderson@duke-nus.edu.sg; Marco.Cavaleri@ema.europa.eu; mariette.ducatez@envt.fr; b.rockx@erasmusmc.nl; b.haagmans@erasmusmc.nl; Hana.Golding@fda.hhs.gov; Tracy.MacGill@fda.hhs.gov; tony.wang@fda.hhs.gov; philip.krause@fda.hhs.gov; robin.levis@fda.hhs.gov; Martin.Beer@fli.de; ThomasC.Mettenleiter@fli.de; (b)(6) @yahoo.com; rhakami@gmu.edu; Asisa.Volz@tiho-hannover.de; dbarouch@bidmc.harvard.edu; esulkowska@rics.bwh.harvard.edu; luk_vandenberghe@meei.harvard.edu; Nerea_ZabaletaLasarte@MEEI.HARVARD.EDU; lawton.stubbert@canada.ca; jfwchan@hku.hk; hlchen@hku.hk; CarlosAlberto.Guzman@helmholtz-hzi.de; florian.krammer@mssm.edu; lisa.chakrabarti@pasteur.fr; christiane.gerke@pasteur.fr; nadia.khelef@pasteur.fr; seungtaek.kim@ip-korea.org; mksong@ivi.int; joaquim.segales@irta.cat; julia.vergara@irta.cat; tomeri@iibr.gov.il; nirp@iibr.gov.il;

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Subject: WHO COVID-19 Animal Models Group Call
When: Thursday, February 18, 2021 6:00 AM-7:30 AM (UTC-08:00) Pacific Time (US & Canada).
Where: https://who.zoom.us/ (b)(6)

Agenda to follow.

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103.122.166.55 (Australia)
149.137.40.110 (Singapore)
64.211.144.160 (Brazil)
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Meeting ID: (b)(6)

From: Anna P Durbin [adurbin1@jhu.edu]
Sent: 2/16/2021 8:03:59 AM
To: KAZI, Fatema [kazif@who.int]
CC: Levine, Myron [mlevine@som.umaryland.edu]; Salim Abdullah (b)(6) @gmail.com]; Yaseen Arabi (b)(6) @yahoo.com]; Mrs D.M. Darko (b)(6) @yahoo.co.uk) (b)(6) @yahoo.co.uk]; Anna P Durbin [adurbin1@jhu.edu]; Vincente Estrada [vicente.estrada@salud.madrid.org]; Zeb Jamrozik [zeb.jamrozik@monash.edu]; Peter Kremsner [peter.kremsner@uni-tuebingen.de]; Rosanna Lagos (rosanna.lagos@adsl.tie.cl) [rosanna.lagos@adsl.tie.cl]; Punnee Pitisuttithum [punnee.pit@mahidol.ac.th]; Plotkin@vaxconsult.com; Robert Sauerwein [robert.sauerwein@radboudumc.nl]; zlshi (zlshi@wh.iov.cn) [zlshi@wh.iov.cn]; Halvor Sommerfelt [halvor.sommerfelt@uib.no]; Kanta Subbarao [kanta.subbarao@influenzacentre.org]; John Treanor [john_treanor@urmc.rochester.edu]; sudhanshu vrati (vrati@rcb.res.in) [vrati@rcb.res.in]; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Anastazia.OlderAguilar@gatesfoundation.org; S.Balasingam@wellcome.org; ccasetti@niaid.nih.gov; D.King@wellcome.ac.uk; C.Weller@wellcome.ac.uk; Andrew Catchpole [a.catchpole@hvivo.com]; Cavaleri Marco (Marco.Cavaleri@ema.europa.eu) [Marco.Cavaleri@ema.europa.eu]; Med.Wilbur.chen@som.umaryland.edu; Chiu, Christopher [c.chiu@imperial.ac.uk]; Dr Ulrich Josef FRUTH (fruthu@bluewin.ch) [fruthu@bluewin.ch]; cgrady@nih.gov; Jacobs, Michael [michael.jacobs@ucl.ac.uk]; Rob Lambkin-Williams [rlw@virologyconsult.com]; a.mann@hvivo.com; Helen McShane [helen.mcshane@ndm.ox.ac.uk]; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; Memoli, Matthew J (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d6c800214484ef9a37242c009098597-HHS-memolim]; p.openshaw@imperial.ac.uk; Richard.peto@ndph.ox.ac.uk; Andrew Pollard (andrew.pollard@paediatrics.ox.ac.uk) [andrew.pollard@paediatrics.ox.ac.uk]; scquinn@umd.edu; M.Roestenberg@lumc.nl; ssow@cvd-mali.org; Sow, Samba [ssow@medicine.umaryland.edu]; SeShah@luriechildrens.org; sspinola@iu.edu; cweijer@uwo.ca; DIAZ, Janet Victoria [diazj@who.int]; HENAO RESTREPO, Ana Maria [henaorestrepoa@who.int]; LITTLER, Katherine [littlerk@who.int]; O'BRIEN, Katherine [obrienk@who.int]; PREZIOSI, Marie-pierre [preziosim@who.int]; RIVEROS BALTA, Ximena [lauriex@who.int]; RODRIGUEZ HERNANDEZ, Carmen A. [rodriguezhernandezc@who.int]; RYAN, Michael J. [ryanm@who.int]; SATHIYAMOORTHY, Vaseeharan [moorthyv@who.int]; SIMÃO, Mariângela [simaom@who.int]; SWAMINATHAN, Soumya [swaminathans@who.int]; GRUBO, Myriam Zineb [grubom@who.int]; pierre.vandamme@uantwerpen.be; Stanley Plotkin (stanley.plotkin@vaxconsult.com) [stanley.plotkin@vaxconsult.com]; wchen@som.umaryland.edu; cristina.cassetti@nih.gov; Chen, Wilbur [wilbur.chen@som.umaryland.edu]; FEIKIN, Daniel [feikind@who.int]; FRIEDE, Martin Howell [friedem@who.int]; GIERSING, Birgitte [giersingb@who.int]; D.King [D.King@wellcome.org]; Charlie Weller [C.Weller@wellcome.org]; R.Sauerwein@tropiq.nl
Subject: Re: SAVE THE DATE - Advisory Group on the Feasibility, Potential Value and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Healthy Young Adult Volunteers

Dear Fatema,
I will be giving COVID grand rounds to my ID division from 8:30 to 9:30 so will have to leave the meeting @14:20. I will rejoin at the end.
Anna

Anna Durbin, M.D.
Professor, International Health

Johns Hopkins Bloomberg School of Public Health
624 N. Broadway, Room 251
(w) 410-614-4736
www.centerforimmunizationresearch.org

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On Feb 16, 2021, at 2:01 AM, KAZI, Fatema <kazif@who.int> wrote:

External Email - Use Caution

Dear all

We would like to reschedule the call for **Tuesday 23rd Feb, 13:00 – 16:00 CET**, please re-confirm your attendance for the meeting of the Advisory Group on the Feasibility, Potential Value and Limitations of Establishing a Closely-Monitored Challenge Model of Experimental COVID-19 in Health Young Adult Volunteers.

We will send the objectives and agenda in the following days.

Join Zoom Meeting
https://who.zoom.us (b)(6)
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From: Ferro, Phil J. EOP/NSC [(b)(6)@nsc.eop.gov]
Sent: 1/22/2020 9:18:53 PM
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Subject: nCoV (b)(5) SOC 22 January 2020

Attachments: nCoV (b)(5) _SOC_21jan22_FINAL.docx

Dear Colleagues,

Please find attached the SOC from Today's (b)(5) FYSA we will convene another PCC tomorrow at 11:00 a.m. in EEOB Room 374 (SMS). A calendar invitation with WAVES link was sent earlier this evening.

As always thank you for all of your hard work on this important and urgent issue.

Best,

Phil

Philip J. Ferro, PhD, MS
Director for Countering Biological Threats
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(U) Summary of Conclusions for
(b)(5) on
Countering Biological Threats

Topic: (U//FOUO) United States Novel Corona Virus (nCoV) Response
Wednesday, January 22, 2020
1:30 - 3:00 p.m.
WHSR

(U) PARTICIPANTS:

Chair
Anthony Ruggiero

NSC Staff
Phil Ferro
Lauren Fabina
Gary Seffel
Hillary Carter
Katelyn Christ
Michael Sinclair
Patrick Lowry
Ivan Kanapathy

OSTP
Kelvin Droegemeier
Ian Watson
Paige Waterman

DPC
James Baehr
Maria Bonner
Kamran Daran

OMB
Christine Farquharson

USAID
Richared Greene

FAA
Alex Naar

GSA
Paul Detitta

State
Gregory Martin
Eric Carlson
Rich Waters
Nausher Ali
Virgil Carstens
Larry Padget

HHS
Robert Redfield
Rick Bright
Robert Johnson
Erika Elvander
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Chris Magrino
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CDR Amber Biles
MAJ Katherine Kinder
Vanessa Eddy
John Trigilio

DOT
Brett Feddersen
Amie Kalsbeek

FDA-CBER-2020-5341-0006439

(b)(5)

FDA-CBER-2020-5341-0006440

Sent: 7/7/2020 10:38:59 AM
Subject: FW: China COVID-19 Vaccine Development Update

China COVID-19 Vaccine Development Update
This update on COVID-19 vaccine developments in China summarizes sources including news/media releases, pharmaceutical company websites, WHO/Chinese/NIH Clinical Trial Registries and peer-reviewed publications. As of 30 June 2020, 7 Chinese candidate vaccines are in human clinical trials.
Table: China COVID-19 Candidate Vaccines under Clinical Evaluation as of June 30, 2020
Type of candidate vaccine
Developer
Other partners
Registration No.
Outcome/Status
R&D in China
Inactivated: CoronaVac
Sinovac
Butantan (Brazil)
NCT04324606
Phase I/II un-blinded on June 13 [1]
Inactivated: BBIBP-CorV
CNBG BJ/Sinopharm
Tiantan Bio Product inc, China CDC, Henan CDC, NHC, Chinese Academy of Medical Science
ChiCTR2000032459
Phase I/II un-blinded on June 28 [2]
Inactivated
CNBG WH/Sinopharm
Wuhan Institute of Virology; Henan CDC
ChiCTR2000031809
Phase I/II un-blinded on June 16[3]
Inactivated
IMBCAMS*
West China Second University Hospital, Yu Nan CDC
NCT04412538
Phase I complete, Phase II started June 18
Ad5-nCoV
Cansino;
Insitute of Biotechbiology, Military Medical Science, PLA
Beijing Institute of Biotechnology;
Canadian Center for Vaccinology
ChiCTR2000030906 ChiCTR2000031781
NCT04398147;
NCT04341389
Phase I preliminary result[4]
Phase I/II ongoing
Protein subunit
Anhui Zhifei Longcom
Institute of Microbiology, Chinese
Academy of Sciences
Clinical trial approved on June 23
mRNA
Walvax, Abogen Academy of Military Medicine, PLA
Shulan Hospital (Hangzhou); Yongfu County CDC (Guangxi)
ChiCTR2000034112
Clinical trial approved on June 24
Not R&D in China
LNP-mRNAs
BioNTech /Pfizer
Fosun Pharma
NCT04368728
Ongoing in US
DNA plasmid with electroporation
Inovio Pharmaceuticals
Aidiweixin,
CEPI
NCT04336410
Ongoing in US
* IMBCAMS: Institute of Medical Biology Chinese Academy of Medical Sciences
Notes:
[1] On 13 June, Sinovac announced preliminary results for the phase I/II clinical trial, which showed favorable immunogenicity and safety profiles. In total, 743 healthy volunteers, aged from 18 to 59 years old, were enrolled. Of those, 143 volunteers were in the phase I trial and 600 volunteers were in the phase II trial. No severe adverse events were reported in the phase I or phase II trials. The phase II

trial demonstrated the reduction of neutralizing antibodies 14 days after the vaccination with a 0, 14 day schedule. The neutralizing antibody seroconversion rate is above 90%.
[2] On 28 June, the Sina-financial News reported unblinded results from the CNBG Beijing inactivated vaccine phase I/II trial: neutralizing antibody positive conversion rate reaches 100% within 28 days and no SAE were noted.
[3] On 16 June, Xinhua News reported unblinded results from the CNBG Wuhan inactivated vaccine phase I/II trial: neutralizing antibody positive conversion rate reaches 100% within 28 days.
[4] Published preliminary phase I results: Safety: >1 adverse reaction within the first 7 days after the vaccination reported among 87 (80.5%) participants. The most common local AE was pain (54%) and systematic AE was fever (46%). No SAE were reported. Immunogenicity: Antibody response increased significantly and peaked at 28 days. Specific T-cell response peaked at day 14.

Major Developments:

On 24 June the National Medical Products Administration (NMPA) approved Walvax & Abogen's mRNA vaccine phase I clinical trial.

CanSino Biologics reported its Ad5-nCoV vaccine received a one-year designation as a "military-specially-needed drug" from the Central Military Commission meaning it can be developed through the military system pharmaceutical production for China's armed forces.

On 23 June CNBG Beijing reached an agreement to conduct phase III clinical trials for inactivated vaccine in UAE.

Sinovac and Instituto Butantan (Brazilian drug maker) will initiate a 9,000 person phase III trial in Brazil in July.

On the Horizon:

According to news from China, three vaccines have completed phase I/II trials and will move to phase III soon.

A mRNA vaccine developed by Fudan University/RNACure Biopharma has completed animal studies and is expected to move to human trials soon.

FDA-CBER-2020-5341-0006442

From: vinu arumugham (b)(6) @yahoo.com]
Sent: 8/22/2020 3:12:16 AM
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Subject: Thanks for exposing the criminals at the UNC Bio Hazard Labs; Now you know why these criminal "scientists" are covering up for Wuhan

Regarding:

https://www.propublica.org/article/near-misses-at-unc-chapel-hills-high-security-lab-illustrate-risk-of-accidents-with-coronaviruses

Thanks for exposing this.

Now you know why the criminals who authored this article were in a hurry to protect their sloppy Chinese friends in the Wuhan labs:

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30418-9/fulltext

They don't want YOU nosing around THEIR US/European labs.

Why are some of the US' top scientists making a specious argument about the natural origin of SARS-CoV-2?

http://anthraxvaccine.blogspot.com/2020/04/why-are-some-of-us-top-scientists.html

Wuhan lab ACCIDENTALLY created SARS-COV-2 because they are sloppy. Their lab leaks like a sieve. They don't know where their viruses are. So their viruses are infecting cell cultures, growing and spreading until you discover it as COVID-19.

Details:

Root cause of COVID-19? Biotechnology's dirty secret: Contamination. Bioinformatics evidence demonstrates that SARS-CoV-2 was created in a laboratory, unlikely to be a bioweapon but most likely a result of sloppy experiments

https://doi.org/10.5281/zenodo.3766462

Coronavirus may have been a 'cell-culture experiment' gone wrong
https://www.skynews.com.au/details/_6158843835001

SARS-CoV-2 is well adapted for humans. What does this mean for re-emergence?

https://www.biorxiv.org/content/10.1101/2020.05.01.073262v1

It was "well adapted" for humans because it grew in human embryonic kidney cells in the Wuhan lab.

Thanks,

Vinu

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Subject: [EXTERNAL] COVID-19: Biden, COVID-19 Response Team , House Coronavirus Crisis Subcommittee, and House Science Committee

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President Biden delivers remarks at a Pfizer manufacturing plant in Kalamazoo, Michigan.
https://www.c-span.org/video/?509173-1/president-biden-delivers-remarks-pfizer-plant

The White House COVID-19 Response Team gave an update on the nationwide numbers and vaccine research and distribution in a briefing with reporters. Andy Slavitt, the COVID-19 senior adviser, said there's a backlog of more than six million vaccine doses due to a large winter storm that wreaked havoc on Oklahoma, Texas, Louisiana and other states. He added that ongoing work is being done to get these doses where they need to be as quickly as possible. Other topics discussed included vaccine safety and efficacy data for the 12-18 year old age group, school reopening to in-person classes and federal mass vaccination sites.
https://www.c-span.org/video/?509036-1/white-house-holds-coronavirus-briefing#

House Coronavirus Crisis Subcommittee Holds Briefing on Vaccines
The House Subcommittee on the Coronavirus Crisis holds a virtual briefing with public health experts on administering vaccines equitably.
https://www.c-span.org/video/?509155-1/house-coronavirus-crisis-subcommittee-holds-briefing-vaccines

House Science Committee Holds Hearing on Vaccination Efforts
https://www.c-span.org/video/?509101-1/house-science-committee-holds-hearing-vaccination-efforts

Best regards,

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Subject: [EXTERNAL] New Report Documents Causes and Cures for COVID-19 Crisis in Long-Term Care Facilities

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Geography Is Not Destiny: Protecting Nursing Home Residents from the Next Pandemic

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Best regards,

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Subject: [EXTERNAL] What it's like to die from Covid-19: "I wouldn't wish it on my worst enemy": Doctors describe what their sickest coronavirus patients endure.

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What it's like to die from Covid-19

"I wouldn't wish it on my worst enemy": Doctors describe what their sickest coronavirus patients endure.

https://www.vox.com/2021/2/20/22280817/covid-19-deaths-us-nursing-home-icu-ventilator?fbclid=IwAR2d_D0sd6D13yNO94sAik7Yvf6tIB38KSuNy_krJENhwybgeGQasqa3ta4

Best regards,

Kevin Costa

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Subject: [EXTERNAL] Re: — "Biden's top doctor nominee made more than $2 million doing pandemic consulting, speeches,"

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For what it i worth, Dr Murthy also had a conflict of interest issue when he was first appointed to be Surgeon General in 2013, as we wrote here:

For Whom the Door Revolves - from For-Profit Contract Research Organization Leadership to Surgeon General?

https://hcrenewal.blogspot.com/2013/12/for-whom-door-revolves-from-for-profit.html

On Sun, Feb 21, 2021 at 12:37 PM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

— **"Biden's top doctor nominee made more than $2 million doing pandemic consulting, speeches,"** WaPo: "[Vivek Murthy] was paid millions of dollars last year in coronavirus-related consulting for Carnival Corporation's cruise lines, Airbnb's rental properties and other firms, in addition to collecting hundreds of thousands of dollars in speaking fees from dozens of organizations, according to ethics documents that Murthy filed this month. The disclosure caught the attention of longtime health policy hands — saying that Murthy has the most financial entanglements of any surgeon general pick in recent history — and of watchdogs who raise questions about how credible he would be as a spokesperson on the pandemic response and presidential adviser."

Best regards,

Kevin Costa

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"He knew right then he was too far from home." - Bob Seger

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Subject: [EXTERNAL] 'My Plan To End The Pandemic': President Joe Biden

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'My Plan To End The Pandemic': President Joe Biden

https://patch.com/district-columbia/washingtondc/my-plan-end-pandemic-president-joe-biden?fbclid=IwAR32bVHdRqf7pIt3lEbAbJszGkJH2NHazCIWkMKPsywWxyYrZlpZE4xY-DE

Best regards,

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Subject: [EXTERNAL] — "Biden's top doctor nominee made more than $2 million doing pandemic consulting, speeches,"

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— **“Biden’s top doctor nominee made more than $2 million doing pandemic consulting, speeches,”** WaPo: “[Vivek Murthy] was paid millions of dollars last year in coronavirus-related consulting for Carnival Corporation’s cruise lines, Airbnb’s rental properties and other firms, in addition to collecting hundreds of thousands of dollars in speaking fees from dozens of organizations, according to ethics documents that Murthy filed this month. The disclosure caught the attention of longtime health policy hands — saying that Murthy has the most financial entanglements of any surgeon general pick in recent history — and of watchdogs who raise questions about how credible he would be as a spokesperson on the pandemic response and presidential adviser.”

Best regards,

Kevin Costa

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Subject: [EXTERNAL] Examining How Crisis Standards of Care May Lead to Intersectional Medical Discrimination Against COVID-19 Patients

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Examining How Crisis Standards of Care May Lead to Intersectional Medical Discrimination Against COVID-19 Patients

https://justiceinaging.org/wp-content/uploads/2021/02/FINAL-Intersectional-Guide-Crisis-Care-2-10-21.pdf?eType=EmailBlastContent&eId=bfb9e85a-0ec3-4237-b648-eeb781f111d8

Best regards,

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Subject: [EXTERNAL] Fwd: Save the Date: Rally to Lift the Lockdown

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---------- Forwarded message ---------
From: **National Consumer Voice for Quality Long-Term Care** <info@theconsumervoice.org>
Date: Mon, Feb 22, 2021 at 3:41 PM
Subject: Save the Date: Rally to Lift the Lockdown
To: Kevin Costa <kevincosta@alumni.brown.edu>

View this message on our website.

The National CONSUMER VOICE for Quality Long-Term Care formerly NCCNHR

SHARE:

Save the Date: A Virtual Rally to Lift the Lockdown

Friday, March 12, 2021
12:00pm ET

Register Now

Join Consumer Voice for a rally commemorating the one year anniversary of the nursing home visitation ban. The rally will honor those we've lost and provide an opportunity to hear directly from residents and family members about their experiences during the lockdown. It will include a call to action - mobilizing family members, residents of long-term care, and advocates to ask their state and federal policymakers and the Centers for Medicare & Medicaid Services (CMS) to safely "open nursing home doors."

Visit our website to learn more about why it's imperative to lift the lockdown.

Sign the Petition to Reunite Nursing Home Residents with Their Loved Ones

On March 13, 2021, it will be one year since state and federal officials banned visits in nursing homes. Initially put in place to protect residents from COVID-19, the visitation ban has resulted in thousands of residents suffering and dying from isolation, loneliness, and poor care. It is time to stop the suffering and open the doors.

Sign the petition to tell officials of the federal Centers for Medicare and Medicaid Services, Congress, your state legislators, and your Governor to lift the visitation ban now and open nursing home doors.

Sign the Petition Now

FOLLOW US

1001 Connecticut Avenue, NW, Suite 632, Washington, DC 20036
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The National Consumer Voice for Quality Long-Term Care 1975 2020 45 YEARS OF CONSUMER-DRIVEN ADVOCACY

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Sent: 2/17/2021 12:23:52 PM
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Subject: [EXTERNAL] Fwd: Help Celebrate 35 Years of Advocacy at the 2021 Voices of Medicare Summit

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---------- Forwarded message ---------
From: **Judith Stein, Center for Medicare Advocacy** <Director@medicareadvocacy.org>
Date: Wed, Feb 17, 2021 at 12:04 PM
Subject: Help Celebrate 35 Years of Advocacy at the 2021 Voices of Medicare Summit
To: Kevin Costa <KevinCosta@alumni.brown.edu>

Dear Friend,

I hope this note finds you and your loved ones safe and healthy. On behalf of the Center for Medicare Advocacy's board and staff, thank you for being part our growing multi-generational community, one that continues to open doors to necessary health care, which is particularly crucial now. I am writing to invite you to the Center's upcoming special event.

This spring the spirit of the Center's community will shine through these challenging times, as we will be celebrating our 35th Anniversary. I would be honored if you would join us to help kick off the Center's anniversary celebrations at our ***8th Annual National Voices of Medicare Summit & Sen. Jay Rockefeller Lecture* on April 1, 2021 — 35 years to the day since the Center was founded.**

This year's *Summit* will be a virtual program with content presented by leaders in advocacy, policy-making, and academia convening to discuss the best practices, solutions, and opportunities to advance access to comprehensive Medicare, health equity, and quality health care. The *Summit*, like all of our work, is inspired by, and interspersed with, the real experiences and stories of beneficiaries and caretakers.

We are thrilled to announce that **Dr. Donald Berwick will give this year's *Sen. Jay Rockefeller Lecture***. Dr. Berwick is a leading advocate and thought leader for high-quality, equitable health care. He has previously served as Administrator of the Centers for Medicare & Medicaid Services and is currently President Emeritus and Senior Fellow at the Institute for Healthcare Improvement.

In addition to Dr. Berwick's lecture, two timely panels will address: *Challenges and Opportunities Facing Medicare and Health Care in the New Administration and Congress*, and *Acknowledging Health Disparities and Advancing Health Equity*.

To make this year's program more widely accessible in light of these challenging times, we are offering an early registration fee of $35. Please visit our 2021 Summit webpage to find out more – and register now. We would be delighted and grateful to have you with us.

Sincerely,

Judith Stein
Executive Director/Attorney

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Sent: 2/18/2021 9:24:24 AM
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Subject: [EXTERNAL] Provisional Life Expectancy Estimates for January through June, 2020

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Provisional Life Expectancy Estimates for January through June, 2020

https://www.cdc.gov/nchs/data/vsrr/VSRR10-508.pdf

Best regards,

Kevin Costa

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Subject: [EXTERNAL] Rana Hogarth Discusses Racism & Public Health

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Rana Hogarth Discusses Racism & Public Health

University of Illinois History Professor Rana Hogarth discusses the history of racial inequality when it comes to public health.

https://www.c-span.org/video/?509026-4/washington-journal-rana-hogarth-discusses-racism-public-health

Best regards,

Kevin Costa

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Subject: [EXTERNAL] Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

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Agree and a wonderful well-written obituary.

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Sent: Wednesday, February 17, 2021 7:53 AM
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Subject: Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

He was truly a giant among us

On Wed, Feb 17, 2021 at 2:01 AM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

> Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

He created the first effective heart defibrillator and co-founded a physicians group that campaigned against nuclear war, earning a Nobel Peace Prize.

https://www.nytimes.com/2021/02/16/health/bernard-lown-dead.html?fbclid=IwAR21aZW31eBWLjmAIvq65aUNTvV86PG2DC6nQ-Sbvq70fTom7TG5bGNKNoU

Best regards,

Kevin Costa

--

Philip J. Landrigan, MD, MSc, FAAP
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Boston College

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phil.landrigan@bc.edu

From: Philip Landrigan [landrigp@bc.edu]
Sent: 2/17/2021 7:53:07 AM
To: Costa, Kevin [kevincosta@alumni.brown.edu]
CC: A. W. Gaffney (b)(6) @gmail.com]; Aaron David Miller [Aaron.Miller@ceip.org]; Abbe Gluck [abbe.gluck@yale.edu]; Desta, Abiy B. 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Subject: [EXTERNAL] Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

He was truly a giant among us

On Wed, Feb 17, 2021 at 2:01 AM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

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Best regards,

Kevin Costa

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From: David Schildmeier [DSchildmeier@mnarn.org]
Sent: 2/17/2021 9:18:53 AM
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Subject: [EXTERNAL] RE: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

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He worked with our organization, the Mass Nurses Association and others to mobilize a campaign against managed care and health care corporatization. A true giant.

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Sent: Wednesday, February 17, 2021 9:17 AM
To: Philip Landrigan <landrigp@bc.edu>; Costa, Kevin <kevincosta@alumni.brown.edu>
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Subject: Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

I was a Lown student in the mid 1980s. He was always provocative and a thinker who encouraged students to think novel ideas and not be afraid of conventional wisdom. He also encouraged people to raise issues. I loved my month with him.

Ezekiel J. Emanuel, M.D., Ph.D.

Vice Provost for Global Initiatives
Chair, Department of Medical Ethics and Health Policy (On leave 2020-21)

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Date: Wednesday, February 17, 2021 at 7:53 AM
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Subject: Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

He was truly a giant among us

On Wed, Feb 17, 2021 at 2:01 AM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

> Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99
>
> He created the first effective heart defibrillator and co-founded a physicians group that campaigned against nuclear war, earning a Nobel Peace Prize.
>
> https://www.nytimes.com/2021/02/16/health/bernard-lown-dead.html?fbclid=IwAR21aZW31eBWLjmAIvq65aUNTvV86PG2DC6nQ-Sbvq7ofTom7TG5bGNKNoU
>
> Best regards,
>
> Kevin Costa

--
Philip J. Landrigan, MD, MSc, FAAP
Director, Global Public Health Program
Boston College

+(b)(6)
phil.landrigan@bc.edu

From: Emanuel, Ezekiel J [zemanuel@upenn.edu]
Sent: 2/17/2021 9:16:52 AM
To: Philip Landrigan [landrigp@bc.edu]; Costa, Kevin [kevincosta@alumni.brown.edu]
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Subject: [EXTERNAL] Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I was a Lown student in the mid 1980s. He was always provocative and a thinker who encouraged students to think novel ideas and not be afraid of conventional wisdom. He also encouraged people to raise issues. I loved my month with him.

Ezekiel J. Emanuel, M.D., Ph.D.

Vice Provost for Global Initiatives
Chair, Department of Medical Ethics and Health Policy (On leave 2020-21)
Co-Director, Healthcare Transformation Institute
Levy University Professor
Perelman School of Medicine and The Wharton School
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From: Philip Landrigan <landrigp@bc.edu>
Date: Wednesday, February 17, 2021 at 7:53 AM
To: Costa, Kevin <kevincosta@alumni.brown.edu>
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Subject: Re: Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

He was truly a giant among us

On Wed, Feb 17, 2021 at 2:01 AM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

> Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99
>
> He created the first effective heart defibrillator and co-founded a physicians group that campaigned against nuclear war, earning a Nobel Peace Prize.
>
> https://www.nytimes.com/2021/02/16/health/bernard-lown-dead.html?fbclid=IwAR21aZW31eBWLjmAIvq65aUNTvV86PG2DC6nQ-Sbvq7ofTom7TG5bGNKNoU
>
> Best regards,
>
> Kevin Costa

--
Philip J. Landrigan, MD, MSc, FAAP
Director, Global Public Health Program
Boston College

+(b)(6)
phil.landrigan@bc.edu

From: Costa, Kevin [kevincosta@alumni.brown.edu]
Sent: 2/17/2021 5:03:53 PM
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Subject: [EXTERNAL] Re: [PDA Healthcare Human Rights] Hospitals still ration medical N95 masks as stockpiles swell

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Homeland Security News Conference on Counterfeit Masks
Secretary Mayorkas and other Homeland Security officials announce that agents have seized 11 million counterfeit masks in recent weeks as part of an ongoing investigation.
https://www.c-span.org/video/?509086-1/homeland-security-news-conference-counterfeit-masks

On Tue, Feb 16, 2021 at 11:48 PM Dr Bill Honigman (b)(6) @gmail.com> wrote:

> So suppliers claim they've caught up with demand but hospitals are now hoarding N95s for obscure reasons. This situation is crying out for public health guidance. Anyone home???

"...Before the pandemic, medical providers followed manufacturer and government guidelines that called for N95s to be discarded after each use, largely to protect doctors and nurses from catching infectious diseases themselves. As N95s ran short, the Centers for Disease Control and Prevention modified those guidelines to allow for extended use and reuse only if supplies are "depleted," a term left undefined..."

On Tue, Feb 16, 2021, 6:26 PM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

Hospitals still ration medical N95 masks as stockpiles swell

https://apnews.com/article/hospitals-ration-n95-masks-coronavirus-b40b902991b75d8ae4000a20bccd6af4?fbclid=IwAR3Xpanm719JgB67ysnrSwtSaiyUzKVkTHDZOLzW_-Ztsn_82ZqFGdmGeMM

Best regards,

Kevin Costa

--

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Sent: 2/17/2021 3:42:42 PM
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Subject: [EXTERNAL] Racial Health Disparities and Covid-19 — Caution and Context - Merlin Chowkwanyun, Ph.D., M.P.H., and Adolph L. Reed, Jr., Ph.D.

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Racial Health Disparities and Covid-19 — Caution and Context

Merlin Chowkwanyun, Ph.D., M.P.H., and Adolph L. Reed, Jr., Ph.D.

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Best regards,

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Subject: Hospitals still ration medical N95 masks as stockpiles swell

Hospitals still ration medical N95 masks as stockpiles swell

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Subject: [EXTERNAL] Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

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Bernard Lown, Inventive Heart Doctor and Antiwar Activist, Dies at 99

He created the first effective heart defibrillator and co-founded a physicians group that campaigned against nuclear war, earning a Nobel Peace Prize.

https://www.nytimes.com/2021/02/16/health/bernard-lown-dead.html?fbclid=IwAR21aZW31eBWLjmAIvq65aUNTvV86PG2DC6nQ-Sbvq7ofT0m7TG5bGNKN0U

Best regards,

Kevin Costa

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Subject: [EXTERNAL] Lancet Report: 40% of U.S. COVID Deaths Were Preventable. The Country Needs Universal Healthcare Now

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Lancet Report: 40% of U.S. COVID Deaths Were Preventable. The Country Needs Universal Healthcare Now
https://www.democracynow.org/2021/2/15/lancet_report_covid_deaths_universal_healthcare?utm_source=Democracy+Now%21&utm_campaign=043c1b1556-Daily_Digest_COPY_01&utm_medium=email&utm_term=0_fa2346a853-043c1b1556-192343593

Public policy and health in the Trump era
https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32545-9/fulltext

Best regards,

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Subject: House Impeachment Managers' Video Compilation of January 6 Attack on the U.S. Capitol

House Impeachment Managers' Video Compilation of January 6 Attack on the U.S. Capitol

https://www.c-span.org/video/?c4944572/house-impeachment-managers-video-compilation-january-6-attack-us-capitol

Best regards,

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Subject: White House COVID-19 Response Team Briefing Members of the White House COVID-19 Response Team hold a briefing on the administration's efforts to combat the pandemic.

White House COVID-19 Response Team Briefing

Members of the White House COVID-19 Response Team hold a briefing on the administration's efforts to combat the pandemic.

https://www.c-span.org/video/?508700-1/white-house-covid-19-response-team-briefing

Best regards,

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Subject: GLOBAL LAUNCH EVENT OF THE LANCET COMMISSIONON PUBLIC POLICY AND HEALTH IN THE TRUMP ERA

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The Lancet Commission on public policy and health in the Trump era is the first comprehensive assessment of the health effects of President Trump's policies. Led by 33 leading experts from the US, UK and Canada, the Commission was tasked with chronicling the repercussions of the administration's actions and charting policies for a healthy future.

At the launch, the authors will present key findings and recommendations from the Commission. The presentations will be followed by a question and answer session chaired by **Richard Horton**, Editor-in-Chief, *The Lancet*.

Richard Horton will offer welcome remarks. Key findings of the commission will be presented by Roosevelt House faculty associates **Steffie Woolhandler** and **David Himmelstein,** Distinguished Professors of Public Health at Hunter College, City University of New York, and Lecturers at Harvard Medical School; **Mary T. Basset**, former Commissioner of the New York City Department of Health and Mental Hygiene and Director of the François-Xavier Bagnoud Center for Health and Human Rights at Harvard University; and **Kevin Grumbach**, Professor of Family Community Medicine at the University of California, San Francisco. (More speakers to be added.)

This event is hosted by Roosevelt House Public Policy Institute at Hunter College. The Commission will be published by *The Lancet* on 11th February. The Commission was supported by grants from the Doris Duke Charitable Foundation and the Open Society Foundations.

Thursday February 11, 12-1 US ET

Public policy and health in the Trump era: global launch of the *Lancet* Commission

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You are invited to the global launch event of the *Lancet* Commission on public policy and health in the Trump era

The Lancet Commission on public policy and health in the Trump era is the first comprehensive assessment of the health effects of President Trump's policies. Led by 33 leading experts from the US, UK and Canada, the Commission was tasked with chronicling the repercussions of the administration's actions and charting policies for a healthy future.

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Register here: https://community.hunter.cuny.edu/roosevelt-house-pages/global-launch-of-the-lancet-commission-02-11-21---

Presenters and speakers include:

- Richard Horton, Editor-in-Chief, *The Lancet*
- Steffie Woolhandler (City University of New York at Hunter College, New York; Harvard Medical School, Boston)
- David Himmelstein (City University of New York at Hunter College, New York; Harvard Medical School, Boston)
- Mary T Bassett (Harvard University, Cambridge)
- Kevin Grumbach (University of California, San Francisco)

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Subject: Universal health care is such a complex beast that only 32 of the world's 33 developed nations have been able to make it work.

Universal health care is such a complex beast that only 32 of the world's 33 developed nations have been able to make it work.

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Subject: President Biden Takes Virtual Tour of Vaccination Site in Arizona

President Biden Takes Virtual Tour of Vaccination Site in Arizona

President Biden and Vice President Kamala Harris took a virtual tour of the vaccine distribution site set up at State Farm Arena in Glendale, Arizona. Representatives from the Arizona Department of Health, Arizona National Guard and FEMA explained how the stadium was operating as a vaccination site during the coronavirus pandemic. The president and vice president talked about how the site was a model for others around the country, and they praised Arizona Gov. Doug Ducey (R) and the state's senators for their efforts in fighting COVID-19.

https://www.c-span.org/video/?508794-1/president-biden-takes-virtual-tour-vaccination-site-arizona#

Best regards,

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Subject: Re: White House COVID-19 Response Team Briefing

President Biden Announces Community Health Centers Vaccination Program to Launch Next Week and Another Increase in States, Tribes, & Territories' Vaccine Supply

https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/09/fact-sheet-president-biden-announces-community-health-centers-vaccination-program-to-launch-next-week-and-another-increase-in-states-tribes-territories-vaccine-supply/?fbclid=IwAR37ZVBV2f3eOePUzjoJurlk_-zRBWW2q3lv1T7P2-AOCtxRw7OE4-6QHLs

On Tue, Feb 9, 2021 at 8:24 PM Costa, Kevin <kevincosta@alumni.brown.edu> wrote:

White House COVID-19 Response Team Briefing

The White House Coronavirus Task Force held a briefing to announce updates to the administration's response to the coronavirus pandemic. Jeff Zients, coordinator of the president's COVID-19 task force, announced the administration would increase its vaccine distribution to 11 million doses per week to states, tribes and territories. He also announced a partnership with local community centers across the country to provide vaccines to underserved communities. Also participating in the briefing was Marcella Nunez-Smith, who leads the administration's health equity task force.

https://www.c-span.org/video/?508851-1/biden-administration-increase-weekly-doses-11-million-partner-community-health-centers#

Best regards,

Kevin Costa

From: Costa, Kevin [kevincosta@alumni.brown.edu]
Sent: 2/3/2021 8:53:47 PM
To: Max Cotterill [info@medicare4all.org]; Yong-Zhen Zhang [zhangyongzhen@shphc.org.cn]; George Gao [gaof@im.ac.cn]; Lawrence Gostin [gostin@law.georgetown.edu]; Yanzhong Huang [yanzhong.huang@shu.edu]; Maria Repnikova [mrepnikova@gsu.edu]; Ian Lipkin [wil2001@columbia.edu]; Edward Holmes [edward.holmes@sydney.edu.au]; Peter Daszak [daszak@ecohealthalliance.org]; Wang Linfa [linfa.wang@duke-nus.edu.sg]; Dake Kang [dkang@ap.org]; James Palmer [james.palmer@foreignpolicy.com]; Wang Guangfa (b)(6) @hotmail.com]; Gauden Galea [GaleaG@who.int]; Andrew Rambaut [a.rambaut@ed.ac.uk]; Richard Horton [richard.horton@lancet.com]; Maria Van Kerkhove [m.vankerkhove@imperial.ac.uk]; Ngozi Ezike [Ngozi.Ezike@illinois.gov]; Courtney Phillips [Courtney.Phillips@la.gov]; Jill Hunsaker Ryan [Jill.Ryan@state.co.us]; John Barry (b)(6) @aol.com]; Mary T. 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Subject: Fwd: Be part of our dedicated team of mobilizers

---------- Forwarded message ---------
From: **Max Cotterill** <info@medicare4all.org>
Date: Wed, Feb 3, 2021 at 6:52 PM
Subject: Be part of our dedicated team of mobilizers
To: Kevin Costa <kevincosta@alumni.brown.edu>

National Nurses United

Medicare For All!

Kevin, we need to be ready for this push.

Before we know it, the Medicare for All bills will be reintroduced in the House and Senate, and we have to be ready to mobilize around this opportunity to get as many co-sponsors as possible.

So, we created the Medicare for All Rapid Response Team of volunteers to amplify calls-to-action and news around these bills in their communities and online. This is an opportunity to get more involved in the work on the ground to help grow public support for Medicare for All — *and we need you on board.*

The more people we have on this team, the more pressure we can put on individual members of Congress to step up. **Can you sign on right now to join our Medicare for All Rapid Response Team?**

JOIN THE TEAM »

As a volunteer on the team, you'll receive training and support from NNU staff and will be added to a special Slack channel for updates. You'll be a huge part of how we fight for Medicare for All across the country.

And, while our first major push will be around the re-introduction of the bills in Congress, we may continue to use this team throughout the year to mobilize quickly around Medicare for All!

To win Medicare for All, we need passionate supporters like you, Kevin, working with us to spread the word in your communities and online so we can finally win this fight.

Click here to join our Medicare for All Rapid Response Team and learn more.

Can't wait to work with you,

Max Cotterill
Organizer
Nurses' Campaign for Medicare for All

Email us: info@medicare4all.org

Virus-free. www.avast.com

From: Costa, Kevin [kevincosta@alumni.brown.edu]
Sent: 2/5/2021 5:44:22 PM
To: Mark Dudzic Labor Campaign for Single Payer [organizers@laborforsinglepayer.org]; Ali Khan [Ali.Khan@unmc.edu]; Dean Robinson [deanr@polsci.umass.edu]; Rochelle Walensky [RWALENSKY@mgh.harvard.edu]; Marcella Nunez-Smith [marcella.nunez-smith@yale.edu]; Yong-Zhen Zhang [zhangyongzhen@shphc.org.cn]; George Gao [gaof@im.ac.cn]; Lawrence Gostin [gostin@law.georgetown.edu]; Yanzhong Huang [yanzhong.huang@shu.edu]; Maria Repnikova [mrepnikova@gsu.edu]; Ian Lipkin [wil2001@columbia.edu]; Edward Holmes [edward.holmes@sydney.edu.au]; Peter Daszak [daszak@ecohealthalliance.org]; Wang Linfa [linfa.wang@duke-nus.edu.sg]; Dake Kang [dkang@ap.org]; James Palmer [james.palmer@foreignpolicy.com]; Wang Guangfa (b)(6) @hotmail.com]; Gauden Galea [GaleaG@who.int]; Andrew Rambaut [a.rambaut@ed.ac.uk]; Richard Horton [richard.horton@lancet.com]; Maria Van Kerkhove [m.vankerkhove@imperial.ac.uk]; Ngozi Ezike [Ngozi.Ezike@illinois.gov]; Courtney Phillips [Courtney.Phillips@la.gov]; Jill Hunsaker Ryan [Jill.Ryan@state.co.us]; John Barry (b)(6) @aol.com]; Mary T. 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Subject: Fwd: Everything You Ever Wanted to Know About Our January M4A Strategy Conference

---------- Forwarded message ---------

From: **Mark Dudzic, Labor Campaign for Single Payer** <organizers@laborforsinglepayer.org>

Date: Fri, Feb 5, 2021 at 5:26 PM

Subject: Everything You Ever Wanted to Know About Our January M4A Strategy Conference

To: <kevincosta@alumni.brown.edu>

Dear Kevin

Our January 2021 Virtual National Medicare for All Strategy Conference was a huge success. Nearly 1200 attendees. Five evenings of talks and panels. Live plenary and closing events. Over 35 workshops. Opportunities to network and meet other activists.

Thanks to our conference co-hosts at Healthcare Now, **YouTube videos are now available for many of the conference events.** They've posted 27 videos that capture the breadth and depth of this extraordinary event.

Watch Dr. Abdul Ey Sayed, Chicago nurse Martese Chism, Dr. Victoria Dooley, and Professor Dean Robinson explore the links between racial justice and healthcare justice.

Listen to NNU President Zenei Cortez break down the Covid Crisis and the Case for Medicare for All and view a powerful video from the NY State Nurses Association about frontline workers fighting to protect themselves and their patients.

Join noted commentator **Krystal Ball** as she interviews grassroots labor leaders **Ada Briceño, Cherrene Horazuk and Cynthia Phinney** on Medicare for All and the Future of Labor.

Paul Song and Sanjeev Sriram and Diane Archer dissect the likely Biden Administration health policies and the problems with the public option.

Ady Barkan delivers a short, inspirational message and Congresswoman Pramila Jayapal discusses the challenges and opportunities for Medicare for All in the new Congress. This sets the stage for Healthcare Now's Ben Day and NNU's Amirah Sequeira to lay out an outside and inside congressional strategy.

You can also listen to our Opening Plenary and Closing Plenary as panelists grapple with how to build a strategy that will move us towards victory as we emerge from the worst public health crisis and economic crisis in nearly a century.

All of these videos, and more, are available here. They provide important insights into how to build our movement for healthcare justice in 2021 and beyond. Please take the time to review them. It is my hope that you can join us in person when we meet again next year to plot our path to victory.

In Solidarity,
Mark Dudzic
National Coordinator

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Sent: 2/7/2021 4:53:50 PM
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Subject: "Dr. Anand Parekh on the U.S. Coronavirus Response" and "Coved-19: Urgent Federal Actions to Accelerate America's Response"

Dr. Anand Parekh on the U.S. Coronavirus Response
Bipartisan Policy Center Chief Medical Adviser Dr. Anand Parekh discusses the latest on the coronavirus pandemic and BPC's new report on how to improve the U.S. response.
https://www.c-span.org/video/?508578-3/washington-journal-dr-anand-parekh-discusses-us-coronavirus-response

Coved-19: Urgent Federal Actions to Accelerate America's Response
https://bipartisanpolicy.org/report/future-of-health-covid19/

Best regards,

Kevin Costa

From: Costa, Kevin [kevincosta@alumni.brown.edu]
Sent: 2/5/2021 11:05:16 AM
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Subject: Fwd: Statement on the NY Attorney General's Report on Effect of COVID-19 on Nursing Homes

---------- Forwarded message ---------

From: **National Consumer Voice for Quality Long-Term Care** <info@theconsumervoice.org>

Date: Fri, Feb 5, 2021 at 11:01 AM

Subject: Statement on the NY Attorney General's Report on Effect of COVID-19 on Nursing Homes

To: Kevin Costa <kevincosta@alumni.brown.edu>

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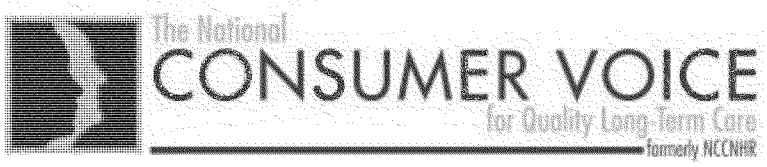

SHARE:

Statement on the New York Attorney General's Report on the Effect of COVID-19 on Nursing Homes in New York

February 5, 2020

On January 28, 2021, the Attorney General of New York, Letitia James (AG), released a scathing preliminary report on the effect of COVID-19 on nursing homes in New York. The report found that pre-existing short-staffing issues were a defining factor in how a great number of nursing homes in New York fared during the first six months of the COVID-19 pandemic. The AG's report found that inadequate staffing led to an increase in neglect and harm unrelated to COVID-19, as well.

Additional findings include:

- Despite long-standing and strict infection control requirements, inadequate training and staff investment resulted in these procedures not being followed which perpetuated the crisis in homes.
- For-profit facilities that diverted funds away from resident care and into profits performed poorly compared with homes that invested in care.
- A facility's history prior to the pandemic of short-staffing was more predictive of outcomes than other factors, including geographic location.
- The granting of immunity from civil liability to nursing homes may have increased the devastation in nursing homes.
- Insufficient testing and training contributed to the crisis.
- The New York Department of Health may have undercounted deaths from COVID-19 by 50%.

The AG's report found that nursing homes in the same geographic area but with low staff ratings had death rates two times higher than similarly located homes with five-star ratings. This finding corresponds with academic studies[1] showing that homes with lower staff and quality ratings performed poorly compared to their higher-rated counterparts.

In January, the Consumer Voice released a report detailing harm and neglect resulting from facilities being locked down and inadequate staffing.

The AG's report echoes the finding of the Consumer Voice report and is further evidence that many in the nursing home industry were unprepared to protect residents from infectious diseases.

Attorney General James recommends numerous actions to protect residents, all of which the Consumer Voice has been calling for since the pandemic began, including:

- Increased staffing with specific staff to resident ratios.
- Transparency in facility ownership and finances.
- The inclusion of family members through in person and electronic visitation.
- The rescission of laws providing immunity from civil liability to nursing homes whose negligent practices result in harm to residents.
- Requiring investment in personal protective equipment and staff training.

The AG's report demonstrates that much of the suffering in nursing homes could have been prevented. Fortunately, the roadmap laid out by the report and by the recommendations of nursing home resident advocates across the country, including the Consumer Voice, provide tangible steps that could immediately protect residents across the country and prevent further devastation in facilities.

See a PDF version of this statement.

[1] *Association of Nursing Home Ratings on Health Inspections, Quality of Care, and Nurse Staffing with COVID-19 Case, Figueroa, et. al.; Nurse Staffing and Coronavirus Infections in California Nursing Homes, Harrington, et. al; Is There a Link Between Nursing Home Reported Quality and COVID-19 Cases? Evidence from California Skilled Nursing Facilities, He, et. al.; COVID-19 Infections ad Deaths Among Connecticut Nursing Home Residents: Facility Correlates, Li, et. al*

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Subject: Re: WHO Viruses reagents and assays working group - No meeting this week

Well received with thanks

Regards,
Supaporn

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ส่งแล้ว: พุธ, 5 สิงหาคม, 2020 1:22:58 AM

เรื่อง: WHO Viruses reagents and assays working group - No meeting this week

Hello all

There will be no meeting of WHO Viruses reagents and assays working group this week (Wed, Aug. 5). We will return next week on Aug 12 at 2:30 PM CET.

Thanks

Bill

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Sent: 9/9/2020 9:52:48 AM
To: galter@partners.org; maria.baca-estrada@canada.ca; baihe@nmpa.gov.cn; rbaric@email.unc.edu; cheryl@gisaid.org; Valentina Bernasconi [valentina.bernasconi@cepi.net]; shinjini.bhatnagar@thsti.res.in; pbieniasz@mail.rockefeller.edu; Bok, Karin (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01205c78ced04c44993d0044fc5a2477-HHS-karin.b]; dboyle@path.org; Bozick, Brooke A (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9db2095d89024bdcbb3f653626eb0df1-HHS-brooke.]; christian.brechot [christian.brechot@pasteur.fr]; Christine.bruce@phe.gov.uk; Carroll, Darin S (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a1e41f0ca9984d0ea6d434fd7dc0908d-HHS-zuz4-cd]; Miles.Carroll@phe.gov.uk; Marco.Cavaleri [Marco.Cavaleri@ema.europa.eu]; MONALISA.CHATTERJI@gatesfoundation.org; MAY.CHU@CUANSCHUTZ.EDU; Carolyn Clark [carolyn.clark@cepi.net]; Corbett, Kizzmekia S (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3e78cec0f97d4240a6a903f9df3adeb2-HHS-kizzmek]; costaa@who.int; Coughlin, Melissa (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=adb6b8daa8404b59a4717f704716909d-HHS-htq4-cd]; shane@lji.org; Crozier, Ian (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8730a536d2c64480b554c36ac8fc2998-HHS-ian.cro]; Damon, Inger K (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=42b35bd733a34c66a5698f43f7026e88-HHS-iad7-cd]; Lisa@amicitiam.com; daszak@ecohealthalliance.org; tdelossantos@path.org; De Wit, Emmie (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0995c7cc65ea4f0ba5e81bfc8b73e271-HHS-Emmie.d]; De Grace, Marciela M (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=44d9d709a9fa4152ade69e7161301ca0-HHS-marciel]; rafael.delgado@salud.madrid.org; mit666666@pitt.edu; katie.doores@kcl.ac.uk; William Dowling [william.dowling@cepi.net]; christian.drosten@charite.de; epstein@ecohealthalliance.org; Erlandson, Karl (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=680b325b1a6e48c1b23db0e7831cf1dd-HHS-Karl.Er]; darryl.falzarano@usask.ca; jason.fernandes@canada.ca; Florence, Clint C (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9642ed58fd1448b78a415dcd78032f54-HHS-clint.f]; MFrieman@som.umaryland.edu; Simon.Funnell@phe.gov.uk; Luc.Gagnon@nexelis.com; Garcia, Mayra [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7db05677732d4023bcdf772ee0474055-GarciaM]; Gerber, Susan I (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c75e9a3507e84f3db20707eeccd86d44-HHS-bhx1-cd]; Volker.gerdts@usask.ca; barney.graham@nih.gov; ahgriff@bu.edu; d.goldblatt@ucl.ac.uk; Elwyn Griffiths [elwyn.griffiths@cepi.net]; gregory.d.gromowski.civ@mail.mil; GSELL, Pierre [gsellp@who.int]; Guthrie, Erica (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9765a47a66cb4adeb84cc9288eaa5893-HHS-ilj2-cd]; b.haagmans@erasmusmc.nl; Helfand, Rita (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ae435981a2b14a1d8b16cfd4c954575f-HHS-rzh7-cd]; henaorestrepoa@who.int; Hensley, Lisa E (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=51c50958b38c47dabf373f6008a0df16-HHS-lisa.he]; paul.hodgson@usask.ca; Holbrook, Michael R (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ab6ac5eb46f1450f8babc160b960169e-HHS-michael]; Johan Holst [johan.holst@cepi.net]; (b)(6) @yahoo.com; Hyde, Terri B (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6c33c926bdee415fb230361ad0d94f22-HHS-tkh4-cd]; REIRELAND@mail.dstl.gov.uk; Jayashankar, Lakshmi (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b140bac304f645cb951ea02cb93cc5a5-HHS-Lakshmi]; djernigan@cdc.gov; Johnson, Reed F (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=427eb2336a9e45058db56d7f6c9372e4-HHS-johnson]; Cassandra.Kelly@finddx.org; Jacqueline.Kirchner@gatesfoundation.org; knezevici [knezevici@who.int]; m.koopmans@erasmusmc.nl; Kovacs, Gerald (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a0c004b329c54ab7b4d2a178e978c04d-HHS-Gerald.]; florian.krammer@mssm.edu; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; skrebs@hivresearch.org; Greg.Kulnis@nexelis.com; Arun Kumar [arun.kumar@cepi.net]; pawinee.k@redcross.or.th;

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Subject: RE: cell paper about very potent highly stable human domain

Dear all,

Here is the paper mentioned by Dimiter on our call today. I tried to send an email with the file , but the email bounced back from most due to the file size. Please just use the link.

Thanks

Bill

From: Dimitrov, Dimiter Stanchev <mit666666@pitt.edu>
Sent: Wednesday, September 9, 2020 9:29 AM
To: William Dowling <william.dowling@cepi.net>
Subject: cell paper about very potent highly stable human domain

CAUTION: This message was sent by an address external to CEPI. Please do not click on links or open attachments unless you recognize the source of this email and know the content is safe. Contact support@intility.no or it@cepi.net if uncertain.

Hi Bill,

I put it on the chat in the last second, here it is
https://www.cell.com/cell/fulltext/S0092-8674(20)31148-X

also attached the file just in case.

It is human domain fused to Fc and every stable – for 3 months at 37C no change in activity.
Was thinking even could be used as reference reagent, you mentioned there is also another candidate.

Best
Mitko
(Dimiter Dimitrov)

From: William Dowling [william.dowling@cepi.net]
Sent: 9/9/2020 9:49:00 AM
To: galter@partners.org; maria.baca-estrada@canada.ca; baihe@nmpa.gov.cn; rbaric@email.unc.edu; cheryl@gisaid.org; Valentina Bernasconi [valentina.bernasconi@cepi.net]; shinjini.bhatnagar@thsti.res.in; pbieniasz@mail.rockefeller.edu; Bok, Karin (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=01205c78ced04c44993d0044fc5a2477-HHS-karin.b]; dboyle@path.org; Bozick, Brooke A (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9db2095d89024bdcbb3f653626eb0df1-HHS-brooke.]; christian.brechot [christian.brechot@pasteur.fr]; Christine.bruce@phe.gov.uk; Carroll, Darin S (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a1e41f0ca9984d0ea6d434fd7dc0908d-HHS-zuz4-cd]; Miles.Carroll@phe.gov.uk; Marco.Cavaleri [Marco.Cavaleri@ema.europa.eu]; MONALISA.CHATTERJI@gatesfoundation.org; MAY.CHU@CUANSCHUTZ.EDU; Carolyn Clark [carolyn.clark@cepi.net]; Corbett, Kizzmekia S (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=3e78cec0f97d4240a6a903f9df3adeb2-HHS-kizzmek]; costaa@who.int; Coughlin, Melissa (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=adb6b8daa8404b59a4717f704716909d-HHS-htq4-cd]; shane@lji.org; Crozier, Ian (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8730a536d2c64480b554c36ac8fc2998-HHS-ian.cro]; Damon, Inger K (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=42b35bd733a34c66a5698f43f7026e88-HHS-iad7-cd]; Lisa@amicitiam.com; daszak@ecohealthalliance.org; tdelossantos@path.org; De Wit, Emmie (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0995c7cc65ea4f0ba5e81bfc8b73e271-HHS-Emmie.d]; De Grace, Marciela M (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=44d9d709a9fa4152ade69e7161301ca0-HHS-marciel]; rafael.delgado@salud.madrid.org; mit666666@pitt.edu; katie.doores@kcl.ac.uk; William Dowling [william.dowling@cepi.net]; christian.drosten@charite.de; epstein@ecohealthalliance.org; Erlandson, Karl (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=680b325b1a6e48c1b23db0e7831cf1dd-HHS-Karl.Er]; darryl.falzarano@usask.ca; jason.fernandes@canada.ca; Florence, Clint C (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9642ed58fd1448b78a415dcd78032f54-HHS-clint.f]; MFrieman@som.umaryland.edu; Simon.Funnell@phe.gov.uk; Luc.Gagnon@nexelis.com; Garcia, Mayra [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7db05677732d4023bcdf772ee0474055-GarciaM]; Gerber, Susan I (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c75e9a3507e84f3db20707eeccd86d44-HHS-bhx1-cd]; Volker.gerdts@usask.ca; barney.graham@nih.gov; ahgriff@bu.edu; d.goldblatt@ucl.ac.uk; Elwyn Griffiths [elwyn.griffiths@cepi.net]; gregory.d.gromowski.civ@mail.mil; GSELL, Pierre [gsellp@who.int]; Guthrie, Erica (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9765a47a66cb4adeb84cc9288eaa5893-HHS-ilj2-cd]; b.haagmans@erasmusmc.nl; Helfand, Rita (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ae435981a2b14a1d8b16cfd4c954575f-HHS-rzh7-cd]; henaorestrepoa@who.int; Hensley, Lisa E (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=51c50958b38c47dabf373f6008a0df16-HHS-lisa.he]; paul.hodgson@usask.ca; Holbrook, Michael R (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ab6ac5eb46f1450f8babc160b960169e-HHS-michael]; Johan Holst [johan.holst@cepi.net]; (b)(6) @yahoo.com; Hyde, Terri B (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6c33c926bdee415fb230361ad0d94f22-HHS-tkh4-cd]; REIRELAND@mail.dstl.gov.uk; Jayashankar, Lakshmi (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b140bac304f645cb951ea02cb93cc5a5-HHS-Lakshmi]; djernigan@cdc.gov; Johnson, Reed F (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=427eb2336a9e45058db56d7f6c9372e4-HHS-johnson]; Cassandra.Kelly@finddx.org; Jacqueline.Kirchner@gatesfoundation.org; knezevici [knezevici@who.int]; m.koopmans@erasmusmc.nl; Kovacs, Gerald (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a0c004b329c54ab7b4d2a178e978c04d-HHS-Gerald.]; florian.krammer@mssm.edu; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; skrebs@hivresearch.org; Greg.Kulnis@nexelis.com; Arun Kumar [arun.kumar@cepi.net]; pawinee.k@redcross.or.th;

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Subject: FW: cell paper about very potent highly stable human domain

Attachments: 20Cell ab8 online published.pdf

Dear all

Here is the paper mentioned by Dimiter on our call today.

Thanks

Bill

From: Dimitrov, Dimiter Stanchev <mit666666@pitt.edu>
Sent: Wednesday, September 9, 2020 9:29 AM
To: William Dowling <william.dowling@cepi.net>
Subject: cell paper about very potent highly stable human domain

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Hi Bill,

I put it on the chat in the last second, here it is
https://www.cell.com/cell/fulltext/S0092-8674(20)31148-X

also attached the file just in case.

It is human domain fused to Fc and every stable – for 3 months at 37C no change in activity.
Was thinking even could be used as reference reagent, you mentioned there is also another candidate.

Best
Mitko
(Dimiter Dimitrov)

From: William Dowling <william.dowling@cepi.net>
Sent: Tuesday, August 4, 2020 2:23 PM
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Subject: [SPAM]WHO Viruses reagents and assays working group - No meeting this week

Hello all

There will be no meeting of WHO Viruses reagents and assays working group this week (Wed, Aug. 5). We will return next week on Aug 12 at 2:30 PM CET.

Thanks

Bill

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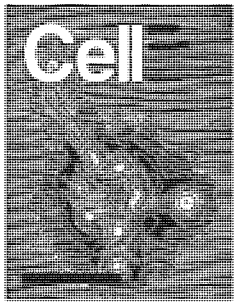

High potency of a bivalent human V_H domain in SARS-CoV-2 animal models

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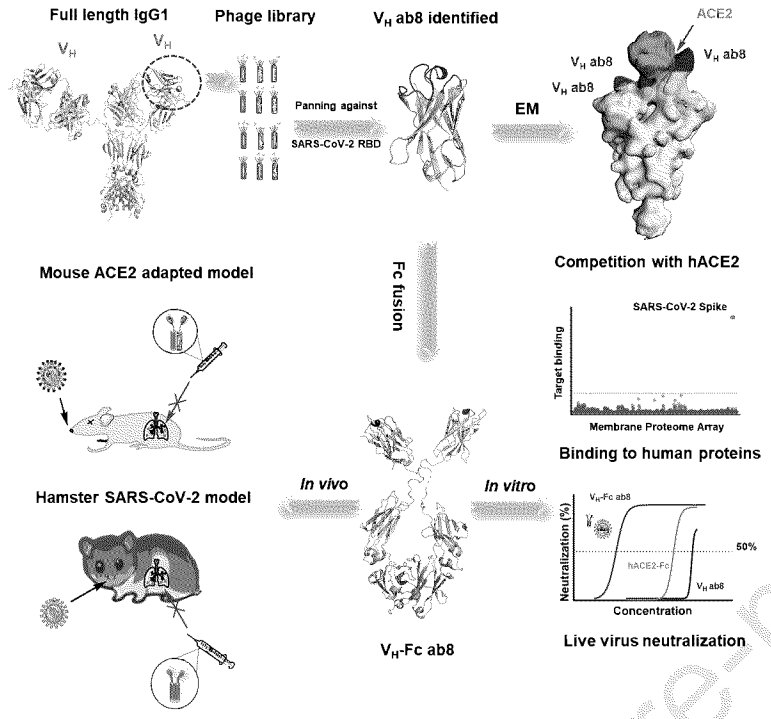

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High potency of a bivalent human V_H domain in SARS-CoV-2 animal models

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Running title: Potent in vivo SARS-CoV-2 neutralization of by a human V_H

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Abstract

Novel COVID-19 therapeutics are urgently needed. We generated a phage-displayed human antibody V_H domain library from which we identified a high-affinity V_H binder ab8. Bivalent V_H, V_H-Fc ab8 bound with high avidity to membrane-associated S glycoprotein and to mutants found in patients. It potently neutralized mouse adapted SARS-CoV-2 in wild type mice at a dose as low as 2 mg/kg and exhibited high prophylactic and therapeutic efficacy in a hamster model of SARS-CoV-2 infection, possibly enhanced by its relatively small size. Electron microscopy combined with scanning mutagenesis identified ab8 interactions with all three S protomers and showed how ab8 neutralized the virus by directly interfering with ACE2 binding. V_H-Fc ab8 did not aggregate and did not bind to 5300 human membrane-associated proteins. The potent neutralization activity of V_H-Fc ab8 combined with good developability properties and cross-reactivity to SARS-CoV-2 mutants provide a strong rationale for its evaluation as a COVID-19 therapeutic.

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Introduction

The global outbreak of a severe acute respiratory distress (SARS) coronavirus 2 (SARS-CoV-2) associated disease 2019 (COVID-19) requires rapid identification of therapeutics and vaccines. While many vaccines are in clinical development, the time to market can be relatively long and immunogenicity can be limited for high-risk groups (Amanat and Krammer, 2020). Alternatively and complementarily, antibodies can be used as safe and effective prophylactics and therapeutics (Pelegrin et al., 2015). Convalescent plasma from COVID-19 patients inhibited SARS-CoV-2 infection and alleviated symptoms of newly infected patients (Casadevall and Pirofski, 2020; Rojas et al., 2020) suggesting that potent neutralizing monoclonal antibodies (mAbs) may be even more effective.

SARS-CoV-2 genome shares more than 80% homology to the SARS-CoV (Li et al., 2020b). Similar to SARS-CoV, SARS-CoV-2 uses the spike (S) envelope glycoprotein to enter into host cells. The viral entry is initiated by the receptor binding domain (RBD) of the S protein binding to its receptor, angiotensin-converting enzyme 2 (ACE2), leading to conformational change of the S2 subunit and formation of six helical-bundle resulting in membrane fusion between viral and host cells (Jiang et al., 2020; Yan et al., 2020). The SARS-CoV RBD contains immune-dominant epitopes that can elicit neutralizing antibodies conferring protection to SARS-CoV infection (He et al., 2005). A recent bioinformatics study showed that SARS-CoV-2 RBD has several B cell epitopes (Grifoni et al., 2020). SARS-CoV-2 RBD based immunogens were able to elicit neutralizing sera in animals (Quinlan et al., 2020). Thus, SARS-CoV-2 RBD is a good target for developing potent neutralizing mAbs. We and others have identified such potent neutralizing human mAbs targeting the RBD of SARS-CoV (Zhu et al., 2007) and the middle east respiratory syndrome coronavirus (MERS-CoV) (Ying et al., 2014a). Recently, several groups have reported the isolation of potent neutralizing antibodies from convalescent human donors but all are in an Immunoglobulin G1 (IgG1) format with a molecular mass of about 150 kDa (Cao et al., 2020; Ju et al., 2020; Rogers et al., 2020; Shi et al., 2020; Zost et al., 2020).

Antibody domains and fragments such as Fab (fragment antigen binding, molecular weight of 50 kDa), scFv (singe-chain variable fragment, 30 kDa) and V_H (heavy chain variable domain, 15 kDa) are attractive antibody formats as candidate therapeutics (Nelson, 2010). For example, isotope labeled antibody fragments are more suitable for bio-imaging due to their better tissue penetration and faster clearance compared to full-size antibodies (Freise and Wu, 2015). Single antibody domains (sAbd), e.g., camelid V_HH (15 kDa) exhibit strong antigen binding and high stability (Harmsen and De Haard, 2007). We and others have demonstrated that human IgG1 heavy chain variable domain (V_H) can be engineered to achieve high stability and affinity to antigens (Nilvebrant et al., 2016), as exemplified by the V_H, m36.4, targeting the human immunodeficiency virus type 1 (HIV-1) envelope glycoprotein co-receptor binding site (Chen et al., 2008a). The V_H domains small size could improve therapeutic efficacy for infectious diseases, such as COVID-19 because of greater penetration to sites of infection. The conformation of the SARS-CoV-2 S trimer is dynamic with only one RBD in the "up" conformation presenting neutralizing epitopes while epitopes in the other two RBDs may be masked (Yan et al., 2020). Small V_Hs may achieve binding to the cryptic RBD epitopes during the dynamic "breathing" of the S trimer (Liu et al., 2020). In addition, V_Hs may have

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an advantage for treatment of respiratory virus infections because V_Hs could efficiently penetrate tissue, especially when using direct delivery through inhalation (Detalle et al., 2016).

To identify potent neutralizing V_Hs against SARS-CoV-2, we panned our large (10^{11} clones) and diverse phage-displayed human V_H antibody library against recombinant RBD. Several V_H binders were isolated and screened for their affinities, ACE2 competition and stabilities. One of those V_Hs, ab8, in an Fc (human IgG1, crystallizable fragment) fusion format, showed potent neutralization activity and specificity against SARS-CoV-2 both in vitro and in two animal models. To our knowledge, this is the first report for high potency of a human antibody domain (V_H) in two animal models of infection.

Results

Selection of a high-affinity V_H, ab8, and its conversion to a V_H-Fc

We generated a large phage-displayed human V_H library where heavy chain complementarity-determining regions (HCDR1, 2, 3s) were grafted into their cognate positions of a stable scaffold based on the germline V_H3-23 (**Figure S1A).** It was panned against recombinant RBD antigens with two different tags (avi-his and human IgG1 Fc tag) which were sequentially used to avoid phage enrichment to tags and related epitopes. The quality of the RBD used for panning was confirmed by ACE2 binding (**Figure S1B and C**). After three rounds of panning, a panel of V_H binders was obtained. Among the highest affinity binders, we selected one, V_H ab8, which did not aggregate during a six-days incubation at 37℃ as tested by dynamic light scattering (DLS) (**Figure S1D**). To increase the V_H ab8 avidity and extend its in vivo half-life, it was converted to a bivalent antibody domain by fusion to the human IgG1 Fc (V_H-Fc ab8) (**Figure S1E**).

High-avidity specific binding of V_H-Fc ab8 to RBD and cell surface associated native S protein

V_H ab8 bound to SARS-CoV-2 RBD and S1 with half-maximal binding concentrations (EC_{50}s) of 10 nM as measured by ELISA (**Figure 1A and D**) and an equilibrium dissociation constant (K_D) of 19 nM as measured by the biolayer interferometry (Blitz system) (**Figure 1B)**. The relatively fast dissociation rate constant ($k_d = 4.1\times 10^{-3}\ S^{-1}$) was significantly (23-fold) decreased by the conversion to a bivalent Fc fusion format ($k_d = 1.8\times 10^{-4}\ S^{-1}$) (**Figure 1E)** resulting in high avidity. V_H-Fc ab8 bound to SARS-CoV-2 RBD and S1 subunit of S protein with EC_{50}s of 0.40 nM and 0.20 nM, respectively, and a K_D of 0.54 nM (**Figure 1E)**. It specifically bound to 293T cells expressing S, but not to control 293T cells **(Figure 1C and Figure S2A)**. The binding of V_H-Fc ab8 was higher than that of IgG1 CR3022, an anti-SARS-CoV antibody cross-reactive with SARS-CoV-2 (Tian et al., 2020). The V_H-Fc ab8's half-maximal FACS measured binding concentration (FC_{50}) of 0.07 nM was higher than that of recombinant human ACE2-Fc (FC_{50} = 0.52 nM) (**Figure 1F)**. These data demonstrate that ab8 selected by an isolated RBD can bind to cell surface associated native S trimer. The binding of V_H-Fc ab8 to the S protein was significantly improved compared to that of the V_H ab8 through avidity effect.

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V_H-Fc ab8 and V_H ab8 outcompete human ACE2-Fc for binding to RBD

Competition with human ACE2 for binding to RBD is a surrogate indicator for antibody neutralization activity. V_H-Fc ab8 outcompeted human ACE2-Fc with a half-maximal inhibitory concentration (IC_{50}) of 1.0 nM **(Figure 2A)**. Note that the V_H-Fc ab8 was much more effective in outcompeting ACE2-Fc than V_H ab8, consistent with its enhanced binding. ACE2 can also block V_H ab8 for binding to RBD (**Figure S2B**) and cell surface associated S (**Figure S2C**). V_H-Fc ab8 also significantly decreased the kinetics of ACE2 binding as measured by Blitz (**Figure 2B**). V_H-Fc ab8 did not bind to the SARS-CoV RBD **(Figure 2C)** and did not compete with CR3022 for binding to RBD **(Figure 2D)**. The CR3022 epitope is located in a conserved region on the RBD core domain distal from the ACE2 binding interface, as seen in the crystal structure of the Fab CR3022-RBD complex (Yuan et al., 2020). These results indicate that the ab8 epitope may overlap with the ACE2 binding site on RBD.

V_H-Fc ab8 binds to SARS-CoV-2 RBD mutants found in patients; an alanine scanning mutation in the distal loop tip of the receptor binding motif (RBM) decreases its binding

Currently, nine prevalent RBD mutants were found in COVID-19 patients (Priyanka et al., 2020). Six of these mutations (F342L, N354D. N354D/D364Y, V367F, R408I, W436R) are located in the RBD core domain and three, K458R, G476S and V483A are in the receptor binding motif (RBM) (**Figure 3A**). V_H-Fc ab8 bound to all mutants similarly to wild type RBD as measured by ELISA (**Figure 3B**). To map the ab8 epitope, we also generated several mutations in non-conserved positions compared to SARS-CoV spanning the footprint of ACE2 on RBM (N439A, G446L, L455A, F456A, A475I, F486A, Q493A, Q498A, N501A, Y505A) (**Figure 3C**). Most of these mutants retained V_H-Fc ab8 binding except F486A, F456A and A475I **(Figure 3D and 3E)**. The F486A significantly decreased binding without affecting the overall RBD conformation (**Figure S2C and S2D**) indicating that F486 directly interacts with ab8. The F456A and A475I mutations decreased the binding by 15% and 40%, respectively, but they also affected the RBD conformation (**Figure S2C and S2D**). These results suggest that a portion of the V_H ab8 epitope could be in the RBM distal loop tip where the F486 is located at (**Figure 3F**).

Electron microscopic analysis of the SARS-CoV-2 S protein ectodomain bound to V_H ab8

To explore structural aspects of SARS-CoV-2 neutralization by V_H ab8, we performed negative stain electron microscopic analysis of the complex formed between the S protein ectodomain and V_H ab8 or soluble ACE2 (**Figure 4**). The density maps showed that both V_H ab8 and ACE2 were in a quaternary conformation in which two of the protomers in the trimer are in the "down" conformation with the third one in the "up" conformation (**Figures 4A and 4B**), similar to the quaternary conformation of the reported ACE2-bound S ectodomain (PDB ID: 6VYB) (Walls et al., 2020). One molecule of the V_H ab8 was observed bound to each RBD domain (**Figure 4A)**. In the ACE2-S complex, one molecule of ACE2 was bound to the S protein trimer, straddling one "up" and one "down" RBD region **(Figure 4B)**. There appears to be a noticeable shift of the "up" RBD domain when it is bound to V_H ab8 (**Figure 4A**). This shift is not observed when ACE2 is bound to the trimer (**Figure 4B**). Superposition of the two density maps reveals that the binding site of V_H ab8 directly overlaps with the ACE2 one, precluding simultaneous occupancy on the S protein ectodomain **(Figure 4C).** We also found that when ACE2 was added subsequent to the

addition of V_H ab8, only the V_H ab8 bound state was observed, further confirming the ACE2 competition with V_H ab8. To better understand the spatial relationship between the site of V_H ab8 binding and that of ACE2 binding, we created a molecular model for ACE2 bound S trimer by aligning the RBD region of the crystal structure of SARS-CoV-2 RBD bound ACE2 (PDB ID: 6M0J) (Lan et al., 2020) to the "up" RBD region in the cryo-EM structure of the trimer (PDB ID: 6YVB) (Wrapp et al., 2020). Superposition of this chimeric structure with the density map of V_H ab8-bound S protein trimers reveals that the bound ACE2 has extensive overlap with the space occupied by bound V_H ab8 (**Figure 4D**). The direct spatial overlap between bound V_H ab8 and ACE2 provides a structural mechanism for the observed effect of ab8 on blocking ACE2 binding. The structural findings also showed that the RBM distal loop, which has F486 at its tip, is directly covered by the footprint of the bound V_H ab8, consistent with the epitope mapping results showing that F486 is a direct contacting residue for ab8.

Potent neutralization of SARS-CoV-2 by V_H-Fc ab8 in vitro

We used four different assays to evaluate V_H-Fc ab8 mediated inhibition of SARS-CoV-2 infection *in vitro*: a β-galactosidase (β-Gal) reporter gene-based quantitative cell-cell fusion assay (Xiao et al., 2003); an HIV-1 backbone-based SARS-CoV-2 pseudovirus assay (Zhao et al., 2013); and two different replication-competent virus neutralization assays (a luciferase reporter gene assay and a microneutralization (MN)-based assay) (Scobey et al., 2013; Yount et al., 2003). V_H-Fc ab8 inhibited cell-cell fusion much more potently than V_H ab8 **(Figure 5A)**. The inhibitory activity of V_H-Fc ab8 was also higher than that of ACE2-Fc. The control anti MERS-CoV antibody IgG1 m336 did not show any inhibitory activity. V_H-Fc ab8 neutralized pseudotyped SARS-CoV-2 virus (IC_{50} = 0.03 μg/ml) more potently than ACE2-Fc (IC_{50} = 0.40 μg/ml) and V_H ab8 (IC_{50} = 0.65 μg/ml) (**Figure 5B**). The pseudovirus neutralization IC_{50} for ACE2-Fc in our assay is comparable to the one reported by Changhai Lei *et al.* (0.03-0.1 μg/ml) (Lei et al., 2020). Interestingly, the maximum neutralization by V_H ab8 was only 50% compared to the 100% by V_H-Fc ab8 and ACE2-Fc, which was also observed for another antibody S309 (Pinto et al., 2020). The complete neutralization by V_H-Fc ab8/ACE2-Fc emphasizes the role of bivalency and related avidity in neutralization (Klasse and Sattentau, 2002). Furthermore, in the reporter gene assay V_H-Fc ab8 neutralized live SARS-CoV-2 with an IC_{50} of 0.04 μg/ml (**Figure 5C**), which is much lower than that for ACE2-Fc (IC_{50} of 6.1 μg/ml) and V_H ab8 (IC_{50} = 29 μg/ml). ACE2-Fc seemed to be much less potent against the live virus compared to the pseudovirus, which is also observed by others (IC_{50} = 12.6 μg/ml) (Case et al., 2020) and may relate to the S expression levels and RBD/S conformation on the virus surface. We also confirmed the high V_H-Fc ab8 live virus neutralization potency by a microneutralization (MN) assay-100% neutralization (NT_{100}) at 0.1 μg/ml (**Figure 5D**). The NT_{100} from the MN assay (0.1 μg/ml) was close to the IC_{100} (0.2 μg/ml) from the reporter gene assay suggesting consistency in the live virus neutralizing activity of V_H-Fc ab8 obtained with two independent assays at two different laboratories. These results suggest that V_H-Fc ab8 is a potent neutralizer of SARS-CoV-2, which correlates with its strong competition with ACE2 for binding to RBD.

High prophylactic efficacy of V_H-Fc ab8 in a mouse ACE2 adapted SARS-CoV-2 infection model

To evaluate the prophylactic efficacy of V_H-Fc ab8 *in vivo*, we used a recently developed mouse ACE2 adapted SARS-CoV-2 infection model, in which wild type BALB/c mice are challenged with SARS-CoV-2 carrying two

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mutations Q498T/P499Y at the ACE2 binding interface in the RBD (Dinnon et al., 2020). It was shown that in this model, the aged BALB/c mice exhibited more clinically relevant phenotypes than those seen in hACE2 transgenic mice (Dinnon et al., 2020). Groups of 5 mice each were administered 36, 8, 2 mg/kg V_H-Fc ab8 prior to high titer (10^5 pfu) SARS-CoV-2 challenge followed by measurement of virus titer in lung tissue 2 days post infection. V_H-Fc ab8 effectively inhibited SARS-CoV-2 in the mouse lung tissue in a dose dependent manner (**Figure 6A**). There was complete neutralization of infectious virus at the highest dose of 36 mg/kg, and statistically significant reduction by 1000-fold at 8 mg/kg. Remarkably, even at the lowest dose of 2 mg/kg it significantly decreased virus titer by 10-fold (two tailed, unpaired *t* test, $p = 0.0075$). To exclude possible effects of residual ab8 on viral titration, we performed another experiment in which mouse lungs were perfused with 10 ml of PBS before harvesting for titration. The perfusion did not affect to any significant degree the infectious virus in the lungs **(Figure 6B)**. The V_H-Fc ab8 completely neutralized the virus in the lungs at 36 mg/kg and significantly reduced infectious virus at 8 mg/kg. V_H-Fc ab8 also reduced viral RNA in the lungs (**Figure 6C).** These results demonstrate the neutralization potency of V_H-Fc ab8 *in vivo*. They also suggest that the double mutations Q498T/P499Y on RBD did not influence V_H-Fc ab8 binding and contribute to the validation of the mouse adapted SARS-CoV-2 model for evaluation of neutralizing antibody efficacy.

V_H-Fc ab8 exhibited both prophylactic and therapeutic efficacy in a hamster model of SARS-CoV-2 infection

Recently hamsters were demonstrated to recapitulate clinical features of SARS-CoV-2 infection (Chan et al., 2020) (Imai et al., 2020). To evaluate the V_H-Fc ab8 efficacy in hamsters, it was intraperitoneally administered either 24 hours before (prophylaxis) or 6 hours after (therapy) intranasal 10^5 $TCID_{50}$ virus challenge. In the therapeutic group, the rationale for administration of the antibody six hours post viral infection is based on the replication cycle length of 5-6 hours after initial infection for SARS-CoV in VeroE6 cells (Keyaerts et al., 2005). Six hours after challenge with a high dose of 10^5 $TCID_{50}$, approximately the same number of susceptible cells could become infected and likely produce much more infectious virus, which would need to be neutralized by the antibody to prevent subsequent cycles of infection. Nasal washes and oral swab at 1, 3, 5 days post infection (dpi) and different lung lobes at 5 dpi were collected. V_H-Fc ab8 decreased viral RNA by 1.7 log in the lung when administered prophylactically. The lung viral RNA decrease in the therapeutic groups was slightly lower (by 1.2 log) (**Figure 6D**). Interestingly, the viral RNA load in the therapeutic groups was to some extent tissue location dependent (**Figure 6F**). The variation of the viral load in different lung lobes may relate to nonuniform antibody transport and viral spread inside the lung. Remarkably, V_H-Fc ab8 alleviated hamster pneumonia and reduced the viral antigen in the lung (H&E staining, **Figure 7A** and **C** and immunohistochemistry **Figure 7B** and **D**). The control hamsters exhibited severe interstitial pneumonia characterized by extensive inflammatory cell infiltration, presence of type II pneumocytes, alveolar septal thickening and alveolar hemorrhage. Both prophylactic and therapeutic treatment of V_H-Fc ab8 reduced the lesions of alveolar epithelial cells, focal hemorrhage and inflammatory cells infiltration. V_H-Fc ab8 also reduced the shedding from mucosal membranes including in nasal washes and oral swabs (**Figure S4**). The decrease in viral RNA in nasal washes and oral swabs were not as large as the decrease observed in the lung tissue, similar to a recent finding in hamsters (Imai et al., 2020). Overall, the

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prophylactic treatment was more effective than the therapeutic treatment in decreasing viral load in nasal washes and oral swabs. Notably, prophylactic administration of V_H-Fc ab8 effectively reduced the infectious virus in the oral swab at 1 dpi, while the post-exposure treatment did not (**Figure S4C** and **G**). Interestingly, viral reduction (except the viral titer in the oral swab at 1 dpi) was more effective at 3 and 5 dpi compared to that at 1 dpi, likely due to the infection peak occurring before day 3 as reported in hamsters (Sia et al., 2020). A striking finding is that V_H-Fc ab8 given therapeutically at as low dose as 3 mg/kg can still decrease viral loads in the lung, nasal washes and oral swabs (**Figure S5**).

We measured the V_H-Fc ab8 concentrations at both doses (10 and 3 mg/kg) in the sera at 1 dpi and 5 dpi in the post-exposure treatment groups (**Figure S5C**). The higher dose (10 mg/kg) resulted in higher antibody concentration and better inhibitory activity than the lower dose (3 mg/kg). The relatively high concentration of V_H-Fc ab8 five days after administration also indicates good pharmacokinetics. Furthermore, we also compared the V_H-Fc ab8 concentration in both the sera and lung with that of IgG1 ab1, which has a similar affinity to SARS-CoV-2 and similar degree of competition with the receptor ACE2 as V_H-Fc ab8 (Li et al., 2020a). We found that the concentration of V_H-Fc ab8 in hamster sera is significantly higher than that of IgG1 ab1 at 1 and 5 dpi after post-exposure administration of the same dose of 10 mg/kg (**Figure 7E**), possibly indicating more effective delivery of V_H-Fc ab8 from the peritoneal cavity to the blood than that of IgG1 ab1. We also found that the V_H-Fc ab8 concentration in all hamster lung lobes was higher than that of the IgG1 ab1 (**Figure 7F**), suggesting that V_H-Fc ab8 appears to penetrate the lung tissue more effectively than IgG1 ab1. These results indicate that the in vivo delivery of V_H-Fc ab8 may be more effective than that of full-size antibodies in an IgG1 format.

V_H-Fc ab8 does not aggregate and does not bind to 5300 human membrane proteins

The V_H-Fc ab8 propensity for aggregation was measured at 37°C by dynamic light scattering (DLS), which detects particle size distributions in the nanometer range (Stetefeld et al., 2016). It displayed a single peak at 11.5 nm which is the size of a monomeric V_H-Fc protein **(Figure S6A)**. The absence of large-size peaks corresponding to large molecular weight species (aggregates) in solution, indicates that V_H-Fc ab8 is highly resistant to aggregation at high concentration (4 mg/ml) and relatively long times of incubation (6 days) at 37°C. The V_H-Fc ab8 propensity for aggregation was also evaluated by size exclusion chromatography (SEC), which showed that >96% of V_H-Fc ab8 was eluted in a peak at a position corresponding to a monomeric state with a molecular weight of 80 kDa (**Figure S6B)**.

Antibody nonspecificity and polyreactivity can be an obstacle for developing an antibody into a clinically useful therapeutic. Polyreactivity may not only cause off-target toxicities and interfere with normal cellular functions, but may also reduce antibody half□life (Chuang et al., 2015). To test for potential polyreactivity of V_H-Fc ab8, a Membrane Proteome Array (MPA) platform was used, in which 5,300 different human membrane protein clones were separately overexpressed in 293T cells in a matrix array achieving a high-throughput detection of binding by FACS. V_H-Fc ab8 did not bind to any of those proteins (**Figure S6C**), demonstrating its lack of polyreactivity and nonspecificity. Interestingly, we did not detect V_H-Fc ab8 binding to the human FcγRIA, which is probably due to the relatively low expression level of FcγRIA on HEK-293T cell surface without concomitant

expression of the common γ chain (Van Vugt et al., 1996). In addition, we found that V_H-Fc ab8 bound to the FcγRs much weaker than IgG1 (**Figure S7**), likely due to the different conformation in the lower hinge region for Fc fusion proteins compared to that of IgG1s (Ying et al., 2014b). For the Fc fusion proteins (even with the same hinge sequence as IgG1), binding to FcγRs may be different from that of IgG1, and can be affected by the fusion partners (Lagassé et al., 2019). The importance of antibody binding to FcγRs for therapeutic or prophylactic efficacy or toxicity in SARS-CoV-2 infection is unknown.

Discussion

Neutralizing mAbs are promising for prophylaxis and therapy of SARS-CoV-2 infections. Recently, many potent neutralizing antibodies from COVID19 patients were identified that neutralize pseudovirus with IC_{50}s ranging from 1 to 300 ng/ml, and replication-competent SARS-CoV-2 with IC_{50}s from 15 to 500 ng/ml (Cao et al., 2020; Ju et al., 2020; Rogers et al., 2020; Shi et al., 2020; Zost et al., 2020). By comparison, the V_H-Fcab8 reported here exhibited comparable or better neutralizing potency against SARS-CoV-2 pseudovirus and live virus (IC_{50}s of 30 ng/ml and 40 ng/ml respectively). Of note, IC_{50}s can vary widely between different assays and laboratories because there is no generally accepted standardized assay. In addition, there are many factors that contribute to potency and efficacy in vivo. Animal models are a more comprehensive and likely more reliable predictor of potential efficacy in humans than in vitro neutralization assays.

To our knowledge V_H-Fc ab8 is the first human antibody domain whose activity was validated in two animal models. In the mouse ACE2 adapted SARS-CoV-2 infection model, V_H-Fc ab8 significantly decreased infectious virus by 10-fold at 2 days post infection even at a very low dose of 2 mg/kg **(Figure 6A)**. It also exhibited both prophylactic and therapeutic efficacy in a hamster model. It not only reduced the viral load in the lung and alleviated pneumonia; but it also reduced shedding in the upper airway (nasal washes and oral swab), which could potentially reduce transmission of SARS-CoV-2. Impressively, V_H-Fc ab8 was active therapeutically even at 3 mg/kg. The finding that V_H-Fc ab8 persisted for 4 days post administration at significant levels indicates that the pharmacokinetics of V_H-Fc ab8 is comparable to that of a full size antibody; the half-lives of Fc fusion proteins were reported to vary from those of IgG1s and can range from hours to days (Unverdorben et al., 2016). The molecular weight of V_H-Fc ab8 (80 kDa) is half of that of full-size IgG1 which suggests an advantage in terms of smaller quantities needed to be produced compared to those for IgG1s to reach similar number of molecules and efficacy. In addition, it was shown that decreasing binder's size exponentially increases its diffusion through normal and tumor tissues (Jain, 1990). Thus, decreasing the size two-fold can increase diffusion through tissues by four-fold. We found that after administration at the same dose, the concentration of V_H-Fc ab8 was higher than that of IgG1 ab1 in both hamster sera and lung tissue. This result might suggest that the V_H-Fc ab8 diffusion from the peritoneal cavity to the blood and penetration of lung may be faster than that of IgG1 ab1. This may further explain its efficacy at low doses in animals. Although the low dose showed efficacy in the small animal models, it should be noted that in humans higher doses could be required to achieve comparable degree of efficacy. Another caveat is that in the

hamster post-exposure experiment, the V_H-Fc ab8 was administered at a time (six hours) when the first round of virus replication was likely completed (Keyaerts et al., 2005), but before the infection peak at 1-2 days (Sia et al., 2020). Because it inhibits infection of new cells, its administration at around the infection peak or after may not be as effective unless it also kills infected cells in vivo which is under investigation.

Recently antibody domains including human V_H and camelid V_HH were reported having varying neutralization potency (Chi et al., 2020; Sun et al., 2020; Wrapp et al., 2020; Wu et al., 2020a). Compared to those domains, V_H-Fc ab8 is unique in terms of potency, aggregation resistance and specificity. V_H-Fc ab8 exhibited good developability properties including stability at high concentrations and long incubation at 37°C, as well as absence or very low aggregation. In addition, V_H-Fc ab8 did not bind to the human cell line 293T even at high concentration (1 μM) which is about 1754-fold higher than its K_d indicating absence of non-specific binding to many membrane-associated human proteins. A similar result was obtained by the membrane protein array assay showing that V_H-Fc ab8 did not bind to any of 5,300 human membrane-associated proteins, indicating its lack of non-specificity and thus low potential for off-target toxicity when used *in vivo*. Besides, unlike camel V_HHs, the V_H ab8 sequence is fully human and therefore likely less immunogenic than that of camelid V_HHs.

Multiple structures are now available for the SARS-CoV-2 S protein trimer in complex with various neutralizing antibodies, offering insight into antigenic epitopes and inhibitory mechanisms critical for S protein neutralization. Epitopes on the SARS-CoV-2 S protein RBD have emerged as effective targets, as evidenced by the action of several RBD binding antibodies including CR3022, B38, C105, CB6, H014, and S309 (Barnes et al., 2020; Lv et al., 2020; Pinto et al., 2020; Shi et al., 2020; Wu et al., 2020b). While B38, C105, and CB6 directly compete with ACE2 for binding sites on the RBD surface, H014 occupies a position distinct from these binding sites, precluding ACE2 binding *via* steric inhibition (Lv et al., 2020). S309 targets the RBD of the S protein both in closed and open S protein conformations, exhibiting a different mechanism of neutralization (Pinto et al., 2020). A recent study of the structure of the S protein trimer in complex with the nanobody H11-D4 (PDB ID: 6Z43) revealed full occupancy of the nanobody on all three RBDs in a "one up and two down" conformation (Huo et al., 2020), similar to what we report here. Our structural analysis demonstrates that the location of the V_H ab8 bound to the trimeric S ectodomain directly overlaps the region that would be occupied by ACE2 when bound to the S protein. The ACE2 blocking is likely the major mechanism of the V_H-Fc ab8 neutralizing activity, which is significantly augmented by avidity effects due to its bivalency. The narrow neutralization concentration range in the live virus neutralization (10-200 ng/ml for 0%-100% neutralization) (**Figure 5D**) indicates a plausible cooperative neutralization mechanism, probably due to the synergistic binding of V_H molecules in V_H-Fc ab8 to RBDs. Due to its small size, V_H may facilitate targeting occluded epitopes on RBD that are otherwise inaccessible to full-length IgGs, which is important because the SARS-CoV-2 S protein is conformationally heterogenous, exposing neutralizing epitopes to varying degrees (Yan et al., 2020). The structural analysis shows that V_H ab8 is able to simultaneously target all three RBD epitopes in both "up" and "down" conformations, which may provide a structural basis for a unique cooperative neutralization mechanism for V_H-Fc ab8. V_H-Fc ab8 with a long flexible linker between V_H and Fc may allow two

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V_H molecules to bind simultaneously two protomers in the same S trimer or cross-link two different protomers from different S trimers.

The ab8 epitope is distal to the CR3022 epitope, explaining its lack of competition with CR3022. The ab8 contact residue F486 (L472 in SARS-CoV) is not conserved which likely explains its lack of cross-reactivity to SARS-CoV. From the GISAID and NCBI databases, we found nine mutations in RBD with relatively high frequencies in current circulating SARS-COV-2. Six of them are in the core domain (F342L, N354D, N354D/D364Y, V367F, R408I and W436R) and three in the RBM (K458R, G476S, V483A). The core domain mutations are far away from the ab8 epitope, thus these mutations do not affect V_H-Fc ab8 binding to RBD. Those three RBM mutations also did not affect ab8 binding although they are close to the ab8 epitope, suggesting that these mutations may not affect ab8 neutralizing activity although neutralization of whole virus carrying these mutations is needed to definitely demonstrate this possibility. Interestingly, V_H-Fc ab8 effectively inhibited the mouse ACE2 adapted SARS-CoV-2 with a Q498T/P499Y mutation in RBD, indicating that this double mutation also does not affect V_H-Fc ab8 binding to RBD. These results suggest that V_H-Fc ab8 may be a broadly cross-reactive SARS-CoV-2 neutralizing antibody.

In conclusion, we identified a fully human antibody V_H domain that shows strong competition with ACE2 for binding to RBD and potent neutralization of SARS-CoV-2 in vitro and in two animal models. This potent neutralizing activity combined with its specificity and good developability properties warrants its further evaluation for prophylaxis and therapy of SARS-CoV-2 infection. Our elucidation of its unique epitope and mechanism of neutralization could also help in the discovery of more potent inhibitors and vaccines.

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AUTHOR CONTRIBUTIONS. DSD, RSB, CTT, JWM, SS, DF and WL conceived and designed the research; WL identified and characterized antibodies; XL and ZS helped to make libraries, characterized antibodies and performed the cell fusion pseudovirus assays. CC made the RBD, ACE2; LZ made and characterized reagents; MU and EP characterized proteins and helped with the proteome assay; DM and AD performed the live virus

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neutralization assays; AS, SSK, DF and SL performed the animal studies; AB, SC, KL, DM, SS, XZ and SS produced and purified the S trimer, carried out the EM experiments and analyzed the structure-related results; DSD and WL wrote the first draft of the article, and all authors discussed the results and contributed to the manuscript.

DECLARATION OF INTERESTS. Wei Li, Chuan Chen, Zehua Sun, John W. Mellors and Dimiter S. Dimitrov are co-inventors of a patent, filed on March 12 by the University of Pittsburgh, related to ab8 described in this paper.

FIGURE LEGENDS

Figure 1. Binding of V_H ab8 and V_H-Fc ab8 to recombinant SARS-CoV-2 RBD and S1 proteins and cell membrane associated S. (A and **D)** V_H and V_H-Fc ab8 binding to recombinant RBD and S1 proteins measured by ELISA. The MERS-CoV antibody IgG1 m336 was used as a negative control. Experiments were performed in duplicate and the error bars denote ± SD, n =2. **(B** and **E)** Kinetics of V_H ab8 (**B**) and V_H-Fc ab8 (**E**) binding to RBD. **(C**) Binding of V_H-Fc ab8, ACE2-Fc and IgG1 CR3022 to S transiently transfected 293T cells (293T-S). The 293T cells without transfection serve as a control. Antibodies or proteins were evaluated at a concentration of 1 μM. (**D**) Concentration-dependent binding of V_H-Fc ab8 and ACE2-Fc to 293T-S cells. See also **Figure S2, panel A**.

Figure 2. Competition of V_H-Fc ab8 and V_H ab8 with ACE2, CR3022 for binding to SARS-CoV-2 RBD and lack of binding of V_H-Fc ab8 to SARS-CoV S1. (A) Competition of V_H-Fc ab8 and V_H ab8 with ACE2 for binding to SARS-CoV-2 RBD. RBD was coated and incubated with 5-fold serially diluted V_H-Fc ab8 and V_H ab8 in the presence of 2 nM ACE2-mFc (mouse Fc). **(B)** Inhibition of ACE2 binding to RBD by V_H-Fc ab8 as measured by Blitz. **(C)** Lack of binding to SARS-CoV S1 as tested by ELISA. SARS-CoV S1 was coated and incubated with V_H-Fc ab8. (**D**) Competition between V_H-Fc ab8 and CR3022 measured by Blitz. ELISA Experiments were performed in duplicate and the error bars denote ± SD. **See also Figure S2, panel B and C**.

Figure 3. Epitope mapping for V_H-Fc ab8 by using naturally occurring RBD mutants from circulating SARS-CoV-2 isolates and by alanine scanning. (**A**) Mapping of natural RBD mutants to RBD/ACE2 3D structure (PDB ID: 6M0J). RBD and ACE2 are represented as cyan and green cartoons with RBM highlighted by red color. The RBD mutants are represented by cyan (core domain mutants) and red (RBM) spheres. (**B**) Binding of V_H-Fc ab8 to those RBD mutant as measured by ELISA. (**C**) Design of Ala scanning mutants to explore the ab8 epitope. RBD/ACE2 structure is based the same PDB as panel **A**. Non-conservative residues spanning ACE2 footprint on RBD compared to SARS-CoV are selected and depicted by stick and sphere representations. (**D**) V_H-Fc ab8 binding to SARS-CoV-2 RBD alanine mutants as tested by ELISA. ELISA procedure is similar to the above described. (**E**) Normalized signals of V_H-Fc ab8 binding to those RBD mutants compared to the WT RBD at the concentration of 1.6 nM derived from the panel **D**. (**F**) Representation of portions of ab8 binding region on RBD based on the epitope mapping ELISA results. F486 in the distal RBM loop is the plausible direct contact residue for ab8. **See also Figure S2, panel D and E.**

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Figure 4. Electron microscopic analysis of the SARS-CoV-2 S protein ectodomain complexed with V_H ab8. (A) Side and top views of the density map of S protein ectodomain (shown in gray) in complex with V_H ab8. The density that we associate with the bound V_H domain is colored red. The open-state structure of the SARS-CoV-2 S protein ectodomain (PDB ID: 6VYB, blue color ribbon) fits well into the map with the exception of the tip of the RBD from the "up" protomer. There appears to be a slight outward shift in the V_H ab8 complex. **(B)** Side and top views of the density map of S protein ectodomain in complex with soluble human ACE2 domain, with density for bound ACE2 shown in blue. **(C)** Superposition of the density maps from (**A**) and (**B**). (**D**) A closer view of the binding site that incorporates the known atomic model for the structure of the ACE2 complex with the RBD in the "up" conformation, delineating the regions of contact with the V_H density. A ribbon representation of the RBM distal loop and the F486 side chain are highlighted in yellow. **See also Figure S3.**

Figure 5. Inhibition of cell-cell fusion and neutralization of pseudotyped and authentic SARS-CoV-2 by V_H-Fc ab8 and V_H ab8. (**A**) Inhibition of cell fusion between 293T-S and 293T-ACE2 cells by V_H ab8, V_H-Fc ab8 and ACE2-Fc. **(B)** Neutralization of SARS-CoV-2 pseudovirus by V_H ab8, V_H-Fc ab8 and ACE2-Fc. **(C)** Neutralization of live SARS-CoV-2 tested in the nLuc reporter assay. **(D)** Neutralization of live virus by a microneutralization assay. Experiments were performed in duplicate and the error bars denote ± SD, n =2.

Figure 6. Evaluation of the prophylactic efficacy of V_H-Fc ab8 in a mouse ACE2 adapted model; and both prophylactic and therapeutic efficacy in a hamster model of SARS-CoV-2 infection. (**A**) V_H-Fc ab8 inhibited mouse ACE2 adapted SARS-CoV-2 in wild type BALB/c mice (two-tailed, unpaired *t* test, ** $p < 0.01$). (**B**) The same experiments as panel **A** except that the mice lung was perfused before viral titration (Mann-Whitney *U* test, $^{**}p < 0.01$). (**C**) The viral RNA level change in the lung in the same mice of panel **B** as quantified by RT-qPCR and presented as $TCID_{50}$ equivalents (Mann-Whitney *U* test, $^{**}p < 0.01$). (**D-F**) Evaluation of the prophylactic and therapeutic efficacy of V_H-Fc ab8 in the hamster model. Hamsters were injected intraperitoneally with 10 mg/kg of V_H-Fc ab8 antibody either one day before (prophylaxis) or six hours after (therapy) intranasal challenge of 1×10^5 $TCID_{50}$ of SARS-CoV-2. (**D**) The decrease of viral RNA in the hamster lung after averaging all lung lobes. (**E** and **F**) The decrease of viral RNA in hamster lung lobes: prophylaxis and therapy, respectively. (Mann-Whitney *U* test, ns: $p > 0.05$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$). **See also Figure S4 and S5.**

Figure 7. Histopathology of hamster lung stained by hematoxylin and eosin stain (H&E) and immunohistochemistry (IHC); comparison of antibody concentrations in the hamster lung and sera between V_H-Fc ab8 and IgG1 ab1. (**A** and **C**) **Reduced pathological changes in lung tissue lobe with V_H-Fc ab8 treatment.** H&E staining of treated and control lung lobes in hamsters challenged with SARS-CoV-2. Arrows showed inflammatory cells and arrow head for alveolar hemorrhages. (**B** and **D**) **Prophylaxis and post-infection treatment with V_H-Fc ab8 decreased SARS-CoV-2 antigen staining in lung lobes of hamsters.** Immunohistochemistry detection of the nucleocapsid antigen of V_H-Fc ab8 prophylactically treated (**B**) and post-exposure treatment (**D**) and control hamster lungs following SARS-CoV-2 challenge. Arrow indicates nucleocapsid positive cells (brown) in lungs lobes of hamsters at day 5 post-infection. (**E** and **F**) Comparison of V_H-Fc ab8 and IgG1 ab1 concentration in the lung and sera of hamsters receiving post-exposure treatment of a dose of 10 mg/kg

(Two-way ANOVA analysis followed by Tukey test, ns, $p > 0.05$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$, $****p < 0.0001$).

SUPPLEMENTARY FIGURE LEGENDS

Figure S1. Schematic representation of V_H library construction strategy, characterization of the RBD-his-biotin as an antigen for panning and evaluation the aggregation propensity of V_H ab8. Related to Star Methods "Generation of a human V_H library, Selection of Binders and Conversion of V_H to V_H-Fc Fusion Protein". (A) Schematic representation of HCDRs grafting into their cognate positions on a stable scaffold. **(B)** ELISA of biotinylated $RBD_{330-532}$ binding to streptavidin-HRP. **(C)** ELISA measurement of binding of biotinylated RBD-his to ACE2. ~100 ng ACE2-Fc was coated on plate with incubation of serially diluted RBD-his-biotin. Binding was detected by using HRP conjugated streptavidin. Experiments were performed in duplicate and the error bars denote ± SD, n =2. (**D**) Evaluation of aggregation of V_H ab8 by DLS. V_H ab8 (4 mg/ml) in PBS was incubated at 37°C. On day 0, day 1 and day 6, samples were taken out for DLS measurement. All measurements were repeated by three times. (**F**) Scheme of conversion of V_H ab8 into V_H-Fc ab8 by fusing IgG1 Fc. The linker between V_H and Fc is the natural human IgG1 upper and lower hinge (DKTHTCPPCPAPELL). V_H ab8 and V_H-Fc ab8 structure is modeled by the online SWISS-MODEL sever (https://swissmodel.expasy.org/).

Figure S2. Concentration dependent binding of V_H-Fc ab8 and ACE2-Fc to cell surface associated SARS-CoV-2 S; evaluation of competition of ACE2 and V_H ab8 by ELISA and FACS; test of the conformation integrity of RBD mutants by using a polyclonal antibody and monoclonal antibody CR3022. Related to Figure 1, 2 and 3. (A) Cells were incubated with serially diluted antibodies or ACE2-Fc and subsequently with PE conjugated anti-human Fc antibody for flow cytometry analysis. Percentage of PE-A+ cells were defined by the above gate strategy in FlowJ, representing the percentage of V_H-Fc ab8 and ACE2-Fc bound 293T-S cells. (**B**) ACE2 blocking V_H ab8 for binding to RBD by ELISA. RBD was coated to plate and 10 nM of V_H ab8 in the presence of gradient concentration of ACE2 was added. Binding was detected by HRP conjugated anti FLAG tag antibody. (**C**) ACE2 blocking V_H ab8 for binding to cell surface associated S. S transiently transfected 293T was incubated with 1 μM V_H ab8 in the presence of various concentration of ACE2 (his tag). Binding of V_H ab8 was detected by the PE conjugated anti FLAG tag antibody. (**D** and **E**) Binding of a mouse polyclonal anti-SARS-CoV-2 RBD antibody and IgG1 CR3022 to the RBD mutants. RBD mutants were coated to plate and two concentrations of polyclonal anti-RBD antibody and CR3022 were added. Binding was detected by HRP conjugated anti mouse (Fc) antibody and anti-human (Fc) antibody. Experiments were performed in duplicate and the error bars denote ± SD, n =2.

Figure S3. Collection and analysis of electron microscopic data. Related to Figure 4. (A) Representative raw micrograph of the SARS-CoV-2 S protein ectodomain complex with V_H ab8. Scale bar 50 nm. **(B)** Selected 2D class averages. Scale bar 10 nm. **(C)** Plot of Fourier Shell Correlation (FSC) between maps constructed from two randomly selected halves of the particle projection images.

Figure S4. Detection of infectious virus and viral RNA in hamster nasal washes and oral swabs. **Related to Figure 6.** Hamsters were injected intraperitoneally with 10 mg/kg of V_H-Fc ab8 antibody either one day before (prophylaxis) or six hours after (therapy) intranasal challenge of 1×10^5 $TCID_{50}$ of SARS-CoV-2. Untreated hamsters were kept as a control. Nasal washes and oral swabs were collected at day one, three and five post infection (dpi) for virus titer titration by viral $TCID_{50}$ assays and viral RNA quantification by RT-qPCR. **(A** and **E).** Nasal washes viral titer in un-treated (control), pre-infection (prophylaxis) treatment and post-infection (therapy) treatment hamsters. **(B** and **F).** Nasal washes viral RNA levels in un-treated, pre-treated and post- treated hamsters. (**C** and **G**) Oral swab viral titer in un-treated, pre-treated and post-treated hamsters. Note that the prophylactic treatment of V_H-Fc ab8 largely decreased the viral tier in the oral swabs at one dpi, while there is almost no effect for the post-infection treatment. **(D** and **H)** Oral swab viral RNA levels in un-treated, pre-treated and post-treated hamsters.

Figure S5. Post-exposure treatment efficacy of V_H-Fc ab8 at two different doses in the hamster model. Related to Figure 6. V_H-Fc ab8 at doses of 10 mg/kg or 3 mg/kg was administered i.p. 6 h after virus intranasal challenge. The hamster shedding including nasal washes and oral swabs were collected at 1, 3, 5 dpi. All hamsters were euthanized on 5 dpi. At the euthanasia, lungs (different lobes) were collected viral RNA quantification by RT-qPCR. (**A** and **D**) Nasal washes viral titer and viral RNA in un-treated (control), 3 mg/kg and 10 mg/kg post-infection treated hamsters. (**B** and **E**) Oral swab viral titer and viral RNA in un-treated (control), 3 mg/kg and 10 mg/kg post-infection treated hamsters. (**C**) Comparison of antibody concentrations in hamster sera for those two doses. Hamsters were bled at one and five dpi for measuring antibody concentrations in sera by SARS-CoV-2 S1 ELISA. Sera was diluted 1:100 and binding was detected by using the goat anti human IgG-HRP. (**F**). Viral RNA levels in different lung lobes. RNA quantity was presented as the $TCID_{50}$ equivalence.

Figure S6. Absent or very low aggregation and high specificity of binding of V_H-Fc ab8. Related to Star Methods "Dynamic Light Scattering, Size Exclusion Chromatography and Membrane Proteome Array Assay". (A) Evaluation of the aggregation of V_H-Fc ab8 by DLS. V_H-Fc ab8 (4 mg/ml) buffered in PBS was incubated at 37°C. On day 0, day 1 and day 6, samples were taken out for DLS measurement on Zetasizer Nano ZS ZEN3600 (Malvern Instruments Limited, Westborough, MA) to determine the size distribution. All measurements were repeated by three times. **(B)** Evaluation of V_H-Fc ab8 aggregation by SEC. Size exclusion was performed by loading 0.22 μm membrane-filtered proteins (150 ul, 1.5 mg/mL) onto the Superdex 200 increase 10/300 GL column. Protein was eluted by PBS buffer in a flow rate of 1.5 mL/min. The arrows indicate the peaks of the MW standards in PBS. **(C)** Lack of non-specific binding measured by a Membrane Proteome Array (MPA). Specificity testing of V_H-Fc ab8 (20 μg/ml) was performed using the MPA platform which comprises 5,300 different human membrane proteins, each overexpressed in live cells. To ensure data validity, each array plate contained positive (SARS-CoV-2 S) and negative (empty vector) controls.

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Figure S7. Binding of V_H-Fc ab8 to human FcγRs measured by ELISA. Related to Star Methods "ELISA for detection of the binding of V_H-Fc ab8 and IgG1 ab1 to human FcγRs". Recombinant FcγRs ectodomains (100 ng) were coated, and biotinylated V_H-Fc ab8 or IgG1 ab1 was added. Binding was detected by Streptavidin HRP. Experiments were performed in duplicate and the error bars denote ± SD, n =2.

STAR*METHODS

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∞ QUANTIFICATION AND STATISTICAL ANALYSIS

KEY RESOURCES TABLE

RESOURCE AVAILABLITY

Lead Contact

Further information and requests for resources and reagents should be directed to and will be fulfilled by the Lead Contact, Dimiter Dimitrov (mit666666@pitt.edu).

Materials Availability

All requests for resources and reagents should be directed to and will be fulfilled by the Lead Contact author. This includes antibodies, viruses, plasmids and proteins. All reagents will be made available on request after completion of a Material Transfer Agreement.

Data and Code Availability

Antibody nucleotide sequence has been deposited to GenBank with an accession number of MT943599. The antibody is only allowed for non-commercial use. All data supporting the findings of this study are available within the paper and are available from the corresponding author upon request.

EXPERIMENTAL MODEL AND SUBJECT DETAILS

Cells and virus

Vero E6 (CRL-1586, American Type Culture Collection (ATCC) and 293T (ATCC) were cultured at 37°C in Dulbecco's Modified Eagle medium (DMEM) supplemented with 10% fetal bovine serum (FBS), 10 mM HEPES pH 7.3, 1 mM sodium pyruvate, and 100 U/mL of penicillin–streptomycin. 293T stably expressing SARS-CoV-2 and human ACE2 was cultured in DMEM medium containing 200 μg/ml Zeocin. HEK293F and expi293F were cultured in FreeStyle 293 serum free medium (ThermoFisher, Cat#12338018) and Expi293™ Expression Medium

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(ThermoFisher, Cat# A1435103), respectively. The SARS-CoV-2 spike pseudotyped HIV-1 backboned virus is packaged in 293T cells after transfecting pNL4-3.luc.RE and pcDNA3.1 S plasmids. The SARS-CoV-2 (US_WA-1/2020) and SARS-CoV2/Canada/ON/VIDO-01/2020 obtained from Centers for Disease Control and Prevention were propagated in Vero E6 cells. The recombinant SARS-CoV-2-SeattlenLuc virus and the mouse ACE2 adapted SAR-CoV-2 virus (carrying a Q498T/P499Y mutation in RBD) recovered by the reverse genetics was produced in VeroE6 cells. All work with infectious SARS-CoV-2 was performed in Institutional Biosafety Committee approved BSL3 facilities using appropriate positive pressure air respirators and protective equipment.

Recombinant proteins

The recombinant proteins SARS-CoV-2 RBD-his, RBD mutants, RBD-Fc, ACE2-hFc were subcloned into pcDNA3.1 expression plasmids, and expressed in expi293F cells. Proteins with his tag were purified by Ni-NTA affinity chromatography and protein with Fc tag purified by protein A chromatography. Protein purity was estimated as >95% by SDS-PAGE and protein concentration was measured spectrophotometrically (NanoVue, GE Healthcare).

Monoclonal antibodies

V_H ab8 antibody was identified by panning of the phage library. V_H-Fc ab8 were constructed by fusing V_H to human IgG1 Fc with the native IgG1 hinge. IgG1 ab1 was obtained by our lab through panning of a Fab phage library. MERS-CoV-specific IgG1 m336 and SARS-CoV antibody IgG1 CR3022 sequences from other groups were subcloned into the pDR12 plasmid for expression. V_H ab8 (in a phagemid pComb3x with a Flag tag) was expressed in HB2151 *E. coli* and purified by Ni-NTA affinity chromatography. All other IgG1 were expressed in expi293 cells and purified with protein A chromatography.

Mouse and hamster experiments

For the mouse model, BALB/c mice purchased from Envigo (BALB/cAnNHsd, stock# 047, immunocompetent, 11-12 months of age, female) were used for all experiments. They are drug/test naïve and negative for pathogens. Animals were not involved in any previous studies. Animals were housed in groups of 5 animals per cage and fed standard chow diet. The study was carried out in accordance with the recommendations for care and use of animals by the Office of Laboratory Animal Welfare (OLAW), National Institutes of Health and the Institutional Animal Care. All mouse studies were performed at the University of North Carolina (Animal Welfare Assurance #A3410-01) using protocols (19-168) approved by the UNC Institutional Animal Care and Use Committee (IACUC) and all virus studies were performed in ABSL3 facilities at UNC. Virus inoculations were performed under anesthesia and all efforts were made to minimize animal suffering. For evaluating prophylactic efficacy of V_H-Fc ab8, mice were intraperitoneally treated (12 hours before infection) with different doses of V_H-Fc ab8 followed by intranasal challenge with 10^5 PFU of mouse-adapted SARS-CoV-2. Two days post infection, mice were sacrificed and perfused with 10 ml PBS. Then lung was harvested for viral titer as determined by the plaque assay. For the hamster model, studies were approved by the University Animal Care Committee (UACC) of the University of

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Saskatchewan according to the guidelines of the Canadian Council on Animal Care (CCAC). Hamsters were purchased from Charles River (male, immunocompetent, healthy, drug/test naïve, free of pathogens). Hamsters were not involved in previous procedures. Hamsters are housed in microisolater cages, typically 3-7/cage. The cages have BioFresh bedding with Crinkle bedding added. Hamsters have access to food and water ab libitum. Food is Lab Diet 5P00 ProLab RMH300. Cages are changed weekly or as needed and spot cleaned. For experiment, hamsters were intraperitoneally treated with V_H-Fc ab8 either 24 hrs before (prophylaxis) or 6 hrs (therapy) after intranasal challenge of 1×10^5 $TCID_{50}$ of SARS-CoV-2. Nasal washes and oral swabs were collected at day 1, 3 and 5 post infection (dpi). Hamsters were bled at 1 and 5 dpi. All hamsters were euthanized on 5 dpi. At euthanasia, lungs were collected for RNA isolation. For viral titer determination, VeroE6 cells $TCID_{50}$ assay was used. For testing viral RNA, viral RNA RT-qPCR was used. For testing antibody concentration at sera and lung, SARS-CoV-2 S1 ELISA was used. For histopathology, 10% formalin fixed and paraffin embedded tissues were processed with either hematoxylin and eosin stain (H&E) or immunohistochemistry (IHC). Lung lobes were scored based on pathology using microscopy.

METHOD DETAILS

Generation, Expression and Characterization of SARS-CoV-2 RBD, S1-Fc, ACE2-Fc, IgG1 m336, and Fab CR3022. The SARS-CoV-2 S and the anti-SARS-CoV antibody IgG1 CR3022 and genes were synthesized by IDT (Coralville, Iowa). MERS-CoV-specific IgG1 m336 antibody was expressed in human mammalian cell as described previously (Ying et al., 2014a). Briefly, IgG1 m336 light chain and heavy chain Fd were subcloned into the pDR12 vector containing dual promoters and a IgG1 Fc cassette. The recombinant plasmid was sequenced and transfected into expi293 cells for expression. The human angiotensin converting enzyme 2 (ACE2) gene was ordered from OriGene (Rockville, MD). The RBD domain (residues 330-532) and S1 domain (residues 14-675) and ACE2 (residues 18-740) genes were cloned in frame to human IgG1 Fc in the mammalian cell expression plasmid pcDNA3.1. The RBD protein with an AviTag followed by a 6×His tag at C-terminal was subcloned similarly. These proteins were expressed with Expi293 expression system (Thermo Fisher Scientific) and purified with protein A resin (GenScript) and by nickel- nitrilotriacetic acid (Ni-NTA) resin (Thermo Fisher Scientific). The Fab CR3022 antibody gene with a His tag was cloned into pCAT2 plasmid (developed in house) for expression in HB2151 bacteria and purified with Ni-NTA resin. Protein purity was estimated as >95% by sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE) and protein concentration was measured spectrophotometrically (NanoVue, GE Healthcare).

Generation of a human V_H library, Selection of Binders and Conversion of V_H to V_H-Fc Fusion Protein. Unlike camel V_HHs, which naturally evolved to be autonomously stable, human V_H is usually unstable and easy to aggregate in the absence of V_L (Li et al., 2016; Nguyen et al., 2000). However, human V_H can be selected or engineered with high stability and solubility. To facilitate identification of stable V_H binders, we chose engineered germline V_H3-23 as our library scaffold (Chen et al., 2008b). Our human V_H phage display library was made by grafting heavy chain CDR1, 2, 3 genes derived from 12 healthy donors' peripheral blood monocytes (PBMCs) and

splenocytes (Takara, Cat. No. 636525) into their cognate positions of a stable scaffold (based on the germline V_H3-23) in a manner similar to the method we previously described but without mutagenesis of CDR1 (Chen et al., 2008a). Briefly, CDRs were PCR-amplified by using primers with degenerated adaptors covering CDRs edge regions from diverse V_H families in one end, and with sequences annealing to the V_H3-23 framework (FR) regions in the other end. The PCR products were then assembled by overlapping extension PCR by using primers with homologous ending. The whole V_H was assembled by overlapping FR1-CDR1-FR2-CDR2 and FR3-CDR3-FR4 fragments. After assembly, the V_H fragment was Sfi I digested followed by ligated into Sfi I linearized pComb3x phagemid. The recombinant phagemid was then purified, desalted and concentrated for electroporation of bacteria TG1, from which the V_H phage particles were rescued and produced. The library size was determined by tittering transformants. The library quality (diversity) was checked by randomly Sanger sequencing hundreds of V_H clones and also evaluated by panning of diverse antigens. This library contains very large number of clones (10^{11}). For panning, the V_H library was alternatively panned against biotinylated RBD-his and RBD-Fc proteins. RBD biotinylation occurred through biotin ligase (BirA) mediated enzymatic conjugation of a single biotin on AviTag (GLNDIFEAQKIEWHE) (Fairhead and Howarth, 2015). The panning was for 3 rounds with input antigens of 10 μg RBD-his, 2 μg RBD-Fc and 0.5 μg RBD-his for the 1st, 2nd and 3rd round, respectively. The panning process begun with incubation of antigens with 10^{12} V_H phage particles followed by washing with phosphate-buffered saline (PBS) containing 0.1% Tween-20. Bound phage pulled down by streptavidin-M280-Dynabeads were rescued by log-phase TG1 cells with the M13KO7 helper phage. After the 3rd round panning, positive clones were selected by soluble expression monoclonal (SEM) ELISA followed by sequencing (Chen et al., 2008b). V_H binders were further screened for their binding affinity, stability and ACE2 competition. For conversion to Fc-fusion, the V_H gene was subcloned into pSecTag B vector containing human IgG1 Fc fragment. V_H-Fc ab8 was expressed as described above.

Enzyme-Linked Immunosorbent Assays (ELISAs). For detection of RBD biotinylation efficacy, horseradish peroxidase (HRP) conjugated streptavidin was used. For conformation of function of RBD-his after biotinylation, 100 ng ACE2-Fc was coated into the plates followed by addition of serially diluted biotinylated RBD-his. HRP conjugated streptavidin was used for detection. For other ELISAs, the SARS-CoV-2 RBD (residues 330-532) protein was coated on 96-well plates (Costar) at 100 ng/well in PBS overnight at 4°C. For screening SEM ELISA, clones randomly picked from the infected TG1 cells were incubated with immobilized antigen. Bound phages were detected with HRP-conjugated mouse anti-FLAG tag Ab (Sigma-Aldrich). For the V_H-Fc binding assay, HRP-conjugated goat anti-human IgG Fc (Sigma-Aldrich) was used for detection. For the competition ELISA with hACE2, 2 nM of human ACE2-mouse Fc was incubated with serially diluted V_H, or V_H-Fc, and the mixtures were added to RBD coated wells. After washing, bound ACE2-mouse Fc was detected by HRP-conjugated anti mouse IgG (Fc specific) (Sigma-Aldrich). For evaluation of ACE2 blocking of V_H ab8 binding to RBD, 10 nM V_H ab8 was incubated with coated RBD in the presence of various concentration of ACE2-His (Sino Biological), and the bound V_H ab8 was detected by HRP conjugated anti FLAG antibody. For evaluation of conformational changes of the epitope mapping RBD mutants, we used a mouse polyclonal anti SARS-CoV-2 RBD antibody (Sino biological, Cat. No. 40592-MP01) and the human IgG1 CR3022 antibody. For measuring the binding of V_H-Fc ab8 to RBD mutants, 100 ng RBD mutant was coated on 96-wells plates and incubated with V_H-Fc ab8 with binding detected by using

HRP conjugated anti human Fc antibody. To evaluate the binding of V_H-Fc ab8 and IgG1 ab1 to human FcγRs, recombinant human FcγRIA, IIA, IIIA were coated on 96-wells plates followed by addition of biotinylated V_H-Fc ab8 and IgG1 ab1. Binding was detected by the streptavidin-HRP. All colors were developed by 3,3′,5,5′-tetramethylbenzidine (TMB, Sigma) and stopped by 1 M H_2SO_4 followed by recording absorbance at 450 nm. Experiments were performed in duplicate and the error bars denote ± 1 SD.

BLItz. Antibody affinities and avidities were analyzed by the biolayer interferometry BLItz (ForteBio, Menlo Park, CA). For measuring V_H ab8 affinity, the RBD-Fc was mounted on the protein A sensor (ForteBio: 18-5010). 125 nM, 250 nM and 500 nM V_H ab8 were used for association. For measuring avidity of V_H-Fc ab8, biotinylated RBD-Fc was immobilized on streptavidin biosensors (ForteBio: 18–5019) for 2 min and equilibrated with Dulbecco's phosphate-buffered saline (DPBS) (pH = 7.4) to establish baselines. 50 nM, 100 nM and 200 nM V_H-Fc ab8 were chosen for association. The association was monitored for 2 min and then the antibody was allowed to dissociate in DPBS for 4 min. The k_a and k_d were derived from sensorgrams fittings and used for K_d calculation. For the competitive Blitz, 500 nM V_H-Fc ab8 was loaded onto the RBD-Fc coated sensor for 300 s to reach saturation followed by dipping the sensor into a 100 nM ACE2-Fc or Fab CR3022 solution in the presence of 500 nM V_H-Fc ab8. The association was monitored for 300 s. The signals from100 nM hACE2 or CR3022 binding to the RBD-Fc coated sensor in the absence of V_H-Fc ab8 was independently recorded in parallel. Competition was determined by the percentage of signal in the presence of V_H-Fc ab8 to signal in the absence of V_H-Fc ab8 (< 0.7 is considered to be competitive) (Wu et al., 2020a).

SARS-CoV-2 RBD Mutants and Epitope Mapping by Ala Scanning. RBD mutants, N354D, N354D/D364Y, V367F, R408I, W436R were purchased from Acro Biosystems. F342L and K458R were bought from Sino Biological. RBD mutants G476S and V483A, plus the alanine (Ala) scanning mutants N439A, G446L, L455A, F456A, A475I, F486A, Q493A, Q498A, N501A, Y505A were constructed by site-directed mutagenesis using QuikChange II XL Site-Directed Mutagenesis Kit (Agilent, cat. no. 200521). Mutants were expressed and purified according to the abovementioned RBD purification procedures. ELISA was used to evaluate the binding of these mutants compared to the wild type RBD.

Electron Microscopy for SARS-CoV-2 S Trimer Complexed with V_H ab8.

A. Expression and Purification. The codon optimized SARS-CoV-2 2P S protein ectodomain construct (GenBank: YP_009724390.1) was C-terminally tagged with 8xHis and a twin Strep tag and cloned into the mammalian expression vector pcDNA 3.1 (Synbio). HEK293F cells were grown in suspension culture using FreeStyle media (ThermoFisher) at 37 °C in a humidified CO_2 incubator (8% CO_2). Cells were transiently transfected at a density of 1 x 10^6 cells/ml using branched polyethylenimine (PEI) (Sigma) (Portolano et al., 2014). Media was exchanged after 24 h and supplemented with 2.2 mM valproic acid. Supernatant was harvested by centrifugation after 4 days, filtered and loaded onto a 5 ml HisTrap HP column (Cytiva). The column was washed with buffer (20 mM Tris pH 8.0, 500 mM NaCl, 20 mM imidazole) and the protein was eluted with buffer (20 mM Tris pH 8.0, 500 mM NaCl, 500 mM imidazole). Purified protein was concentrated (Amicon Ultra 100 kDa cut off, Millipore Sigma) and loaded onto a

Superose 6 column (Cytiva) equilibrated with GF buffer (20 mM Tris pH 8.0 and 150 mM NaCl). Peak fractions were pooled and concentrated to 1.3 mg/ml (Amicon Ultra 100 kDa cut off, Millipore Sigma).

B. Electron Microscopy Specimen Preparation and Data Collection. Purified S protein ectodomain (0.04 mg/ml) was mixed with V_H ab8 (0.02 mg/ml) or soluble ACE2 (0.02 mg/mL) and incubated on ice for 10 mins. For the competition experiment, the S protein (0.04 mg/ml) was first incubated on ice with V_H ab8 (0.02 mg/ml) for 10 mins then followed by addition of ACE2 (0.02 mg/mL) for another 10 mins. The mixtures (4.8 µl) were applied to 300-mesh copper grids coated with continuous ultrathin carbon. Grids were plasma cleaned using an H_2/O_2 gas mixture for 15 s in a Solarus plasma cleaner (Gatan Inc.) prior to adding the sample. Samples were allowed to adsorb for 30 s before blotting away excess liquid, followed by a brief wash with MilliQ H_2O. Grids were stained by three successive applications of 2% (w/v) uranyl formate (20 s, 20 s, 60 s). Grids containing S protein ectodomain with V_H ab8, and S protein ectodomain mixed with both V_H ab8 and soluble ACE2 were imaged using a 200 kV Glacios transmission electron microscope (ThermoFisher Scientific) equipped with a Falcon3 camera operated in linear mode. Using EPU automated acquisition software (ThermoFisher Scientific), 15-frame movies were collected at 92,000x magnification (corresponding to a physical pixel size of 1.6 □) over a defocus range of -0.5 to -3.0 µm with an accumulated total dose of 40 $e^-/Å^2$/movie. Grids containing purified S protein ectodomain (0.04 mg/mL) with soluble ACE2 (0.02 mg/mL) were imaged using a 200kV Glacios transmission electron microscope equipped with a Ceta 16M CMOS camera (ThermoFisher Scientific). Micrographs were collected at 92,000x magnification (physical pixel 1.6 □) over a defocus range of -0.5 to -3.0 µm with a total dose of 50 $e^-/Å^2$ using EPU automated acquisition software.

C. Image Processing. Motion correction and CTF estimation were performed in RELION (3.1) (Scheres, 2012). Particles were picked by crYOLO (1.7.4) (Wagner et al., 2019) with pre-trained model for negative stain data. After extraction, particles were imported to cryoSPARC live (v2.15.1) (Punjani et al., 2017) and subjected to 2D classification and 3D heterogeneous classification. Final density maps were obtained by 3D homogeneous refinement. Figures were prepared using UCSF Chimera (Pettersen et al., 2004).

Flow Cytometry Analysis (FACS). Full-length S protein of SARS-CoV-2 with native signal peptide replaced by the CD5 signal peptide were codon-optimized and synthesized by IDT. The S gene was subcloned into our in-house mammalian cell expression plasmid, which were used to transiently transfect 293T cells cultured in Dulbecco's Modified Eagle's Medium (DMEM) with 10% FBS, 1% penicillin-streptomycin (P/S). The comparisons of ACE2-Fc, IgG1 CR3022 and V_H-Fc ab8 binding to both blank 293T and 293T overexpressing S (293T-S) were performed. For the determination of binding avidity of V_H-Fc ab8 and ACE2-Fc to the cell surface S, serially diluted antibodies or ACE2-Fc with highest concentration of 1 µM were incubated with cells, and after washing, bound antibodies were detected by phycoerythrin (PE) conjugated anti-human Fc antibody (Sigma-Aldrich). PE-A+ cells were detected by flow cytometry using BD LSR II (San Jose, CA). The gating of PE-A+ population was performed by the FlowJo software, which was plotted against the concentrations of proteins to calculate FC_{50} by non-linear fitting in Graphpad Prism 7 (San Diego, CA). To evaluate ACE2 blocking of V_H ab8 binding to cell surface associated S,

gradient concentrations of ACE2-his in the presence of 1 μM V_H ab8 (Flag tag) were incubated with 293-S cells. After washing, V_H ab8 binding was detected by PE conjugated anti FLAG tag antibody.

Cell-Cell Fusion Inhibition Assay. To test antibody mediated inhibition of cell fusion, the β-galactosidase (β-gal) reporter gene based quantitative cell fusion assay was used (Xiao et al., 2003). In this assay, 293T-S cell expression of T7 RNA polymerase was achieved by infection with vaccinia virus VTF7.3, while 293T-ACE2 cell expression of T7 promoter controlled β-Gal was obtained by infection with vaccinia virus VCB21R. β-Gal will be expressed only after fusion of the two types of cells, which can be monitored by chromogenic reactions using β-Gal substrate. To assay cell-cell fusion, 293T cells stably expressing SARS-CoV-2 S (293T-S) cells were infected with T7 polymerase-expressing vaccinia virus (vTF7-3), and 293T cells stably expressing ACE2 (293T-ACE2) were infected with vaccinia virus (vCB21R Lac-Z) encoding T7 promotor controlled β-gal. Two hours after infection, cells were incubated with fresh medium and transferred to 37 °C for overnight incubation. The next day, 293T-S cells were pre-mixed with serially diluted antibodies or ACE2-Fc at 37 °C for 1 h followed by incubation with 293T-ACE2 cells at a 1:1 ratio for 3 h at 37°C. Then cells were then lysed, and the β-gal activity was measured using β□ galactosidase assay kit (substrate CPRG, G-Biosciences, St. Louis, MO) following the manufacturer's protocol. Fusion inhibition percentage (sample reading, F) was normalized by maximal fusion (reading, F_{max}) of 293T-S and 293T-ACE2 cells in the absence of antibodies using this formula: Fusion inhibition % = $[(F_{max}-F)/(F_{max} - F_{blank})] \times 100\%$, in which F_{blank} refers to the OD reading of 293T-S and 293T incubation wells. Fusion inhibition percentage was plotted against antibody concentrations. Experiments were performed in duplicate and the error bars denote ± 1 SD.

Pseudovirus Neutralization Assay. Pseudovirus neutralization assay was performed based on previous protocols (Zhao et al., 2013). Briefly, HIV-1 backbone based pseudovirus was produced in 293T cells by co-transfection with plasmid encoding SARS-CoV-2 S protein and plasmid encoding luciferase expressing HIV-1 genome (pNL4-3.luc.RE) using PEI. Pseudovirus-containing supernatants were collected 48 h later and concentrated using Lenti-X™ concentrator kit (Takara, CA). Pseudovirus neutralization assay was then performed by incubation of SARS-CoV-2 pseudovirus with serially diluted antibodies or ACE2-Fc for 1 h at 37 °C, followed by addition of the mixture into pre-seeded 293T-ACE2 cells. The mixture was then centrifuged at 1000 × g for 1 hour at room temperature. The medium was replaced 4 hrs later. After 24 h, luciferase expression was determined by Bright-Glo kits (Promega, Madison, WI) using BioTek synergy multi-mode reader (Winooski, VT). Cells only and virus only wells were included and used for normalization. The 50% pseudovirus neutralizing antibody titer (IC_{50}) was calculated using Graphpad Prism 7. Experiments were performed in duplicate and the error bars denote ± 1 SD.

SARS-CoV and SARS-CoV-2 Microneutralization Assay. The standard live virus-based microneutralization (MN) assay was used as previously described (Agrawal et al., 2016a; Agrawal et al., 2016b; Du et al., 2013; Du et al., 2014). Briefly, serially three-fold and duplicate dilutions of individual monoclonal antibodies (mAbs) were incubated with 120 pfu of SARS-CoV or SARS-CoV-2 at room temperature for 2 h before transferring into designated wells of confluent Vero E6 cells grown in 96-well microtiter plates. Vero E6 cells cultured with medium with or without virus were included as positive and negative controls, respectively. MERS-CoV RBD-specific

neutralizing m336 mAb (Ying et al., 2014a) were used as additional controls. After incubation at 37 °C for 4 days, individual wells were observed under the microcopy for the status of virus-induced formation of cytopathic effect. The efficacy of individual mAbs was expressed as the lowest concentration capable of completely preventing virus-induced cytopathic effect in 100% of the wells.

SARS-CoV and SARS-CoV-2 Reporter Gene Neutralization Assay. Full-length viruses expressing luciferase were designed and recovered via reverse genetics as described previously (Scobey et al., 2013; Yount et al., 2003). Briefly, the SARS-CoV-2 RNA from infected cell culture was reverse-transcribed and constructed into the seven contiguous genomic cDNA subclones with interconnecting junctions, which were then BsaI/BsmBI digested and ligated into a full-length SARS-CoV-2 genome cDNA through the cohesive ends. A silent mutation of T15102A was introduced into a conserved region in nsp12 to differentiate our recombinant viruses from the circulating SARS-CoV-2 strains through Sanger sequencing. The reporter viruse was synthesized by replacing a 276-bp region in ORF7 with a GFP-fused nanoluciferase (nLuc) gene. After assembly into full-length cDNA, full-length RNA was in vitro transcribed and was electroporated into Vero E6 cells. Virus stocks were propagated on Vero E6 cells in minimal essential medium containing 10% fetal bovine serum (HyClone) and supplemented with penicillin/kanamycin (Gibico). Viruses were tittered in Vero E6 USAMRID cells to obtain a relative light units (RLU) signal of at least 20× the cell only control background. Ab or ACE2-Fc were serially diluted 4-fold up to eight dilution spots with at a starting dilution 100 ∝g/ml, and were incubated with SARS-CoV-UrbaninLuc and SARS-CoV-2-SeattlenLuc viruses at 37℃ with 5% CO_2 for 1 hour. Then virus-antibody dilution complexes were added to the pre-seeding E6 USAMRID cells (20,000) in duplicate. Virus-only controls and cell-only controls were included in each neutralization assay plate. Following infection, plates were incubated at 37 ℃ with 5% CO_2 for 48 hours. Then cells were lysed and luciferase activity was measured via Nano-Glo Luciferase Assay System (Promega) according to the manufacturer specifications. SARS-CoV and SARS-CoV-2 neutralization IC_{50} were defined as the sample concentration at which a 50% reduction in RLU was observed relative to the average of the virus control wells. Experiments were performed in duplicate and IC_{50} was obtained by the non-linear fitting of neutralization curves in Graphpad Prism 7.

Evaluation of the V_H-Fc ab8 Protective Efficacy in a Mouse Adapted SARS-CoV-2 Model. A recombinant mouse ACE2 adapt SARS-CoV-2 variant was constructed by introduction of two amino acid changes (Q498T/P499Y) at the ACE2 binding pocket in RBD. Virus stocks were grown on Vero E6 cells and viral titer was determined by plaque assay (Dinnon et al., 2020). Groups of 5 each of 10 to 12-month old female BALB/c mice (Envigo, #047) were treated prophylactically (12 hours before infection) by intraperitoneal injection with 36, 8, or 2 mg/kg of V_H-Fc ab8, respectively. Mice were challenged intranasally with 10^5 PFU of mouse-adapted SARS-CoV-2. Two days post infection, mice were sacrificed and lung viral titer was determined by the plaque assay. To exclude the residual lung antibody impact on viral titration, mice were euthanized and perfused with 10 ml of PBS via cardiac puncture before lung harvest for viral titration. For virus titration, the caudal lobe of the right lung was homogenized in PBS. The resulting homogenate was serial-diluted and inoculated onto confluent monolayers of Vero E6 cells, followed by agarose overlay. Plaques were visualized via staining with Neutral Red on day 2 post

infection. To measure the viral RNA in the lung, tissue homogenate lysed in Trizol LS (Thermofischer) was then processed with Thermofischer Trizol RNA isolation protocol followed by RT-qPCR using the QuantiFast Probe RT-PCR kit (Qiagen) to amplify a portion of upE gene. The 50% tissue culture infectious doses ($TCID_{50}$) equivalence were estimated by running serial dilutions of known $TCID_{50}$ standards.

Evaluation of the V_H-Fc ab8 Prophylactic and Therapeutic Efficacy in a Hamster Model of SARS-CoV-2 Infection. SARS-CoV2/Canada/ON/VIDO-01/2020 was propagated on Vero'76 cells using DMEM with 2% FBS and 1μg/ml L-(tosylamido-2-phenyl) ethyl chloromethyl ketone (TCPK) trypsin. Infectious work with SARS-CoV-2 was approved by the Biosafety Protocol Approval Committee (BPAC) at the University of Saskatchewan and performed in the high containment laboratories at VIDO-InterVac. Male hamsters (9-week-old) were obtained from Charles River (Montreal, QC). For evaluations of prophylactic efficacy, all hamsters (n=7) were injected intraperitoneally with 10 mg/kg of V_H-Fc ab8 24 hours prior to intranasal challenge of 50 μl/nare containing a total of 1×10^5 $TCID_{50}$ of SARS-CoV-2. For the therapeutic group, hamsters were infected as above and treated intraperitoneally with 10 mg/kg (n=3) or 3 mg/kg (n=4) of V_H-Fc ab8 6 hours post-infection. Untreated hamsters were kept as a control. Nasal washes and oral swabs were collected at day 1, 3 and 5 post infection (dpi). Hamsters were bled at 1 and 5 dpi. All hamsters were euthanized on 5 dpi. At euthanasia, lung lobes were collected for virus titration and RNA isolation. For viral titer determination, nasal washes were diluted in a 10-fold dilution series and absorbed on Vero'76 cells in triplicates for 1 hour at 37°C. Inoculum was removed and replaced with fresh DMEM containing 2% FBS, penn/strep and 1μg/ml TPCK. Cytopathic effect was scored on day 3 and day 5 post infection. The limit of detection is 13.6 $TCID_{50}$. For testing viral RNA, viral RNA isolated from nasal and oral swabs using the QiaAmp Viral RNA mini kit (Qiagen) and the QuantiFast Probe RT-PCR kit (Qiagen) to amplify a portion of upE gene. For RNA levels in tissues, 30 mg of tissue homogenate in buffer RLT were processed with the RNeasy kit (Qiagen) followed by RT-qPCR as above. $TCID_{50}$ equivalence were estimated by running serial dilutions of known $TCID_{50}$ standards. For testing Ab8 concentrations post injection at hamster sera and lung tissue, SARS-CoV-2 spike-1 ELISA was used. S1 protein was coated at 1 μg/ml overnight at 4°C in PBS onto MaxiSorp plates (Nunc). The following day plates were blocked with 5% skim milk and 0.05%Tween20. Serum collected on day 1 and day 5 post-challenge was diluted 1:100 and absorbed for 1 hour at 37 °C. Plates were washed and goat anti human IgG-HRP was added. Plates were washed and subsequently developed with OPD (o-phenylenediamine dihydrochloride) substrate. Optical density was measured at 450 nm after 30 mins of incubation. For lung tissues, after blocking homogenates were diluted 1:10 and absorbed overnight at 4°C followed by detection with anti-human IgG-HRP and substrate as stated above. The control hamster lung homogenate was used for background correction. For histopathology on day 5 p.i., 10% formalin fixed and paraffin embedded tissues were processed with either hematoxylin and eosin stain (H&E) or immunohistochemistry (IHC) for detection of SARS-CoV2 antigen; in IHC after blocking tissue slides were treated with anti-nucleocapsid rabbit polyclonal antibodies followed with anti-rabbit HRP antibody.

Dynamic Light Scattering (DLS). For evaluation of aggregation propensity, V_H ab8 and V_H-Fc ab8 were buffer-changed to DPBS and filtered through a 0.22 μm filter. The concentration was adjusted to 4 mg/mL; 500 μL samples

were incubated at 37 °C. On day 0, day 1 and day 6, samples were taken out for DLS measurement on Zetasizer Nano ZS ZEN3600 (Malvern Instruments Limited, Westborough, MA) to determine the size distributions of protein particles.

Size Exclusion Chromatography (SEC). The Superdex 200 Increase 10/300 GL chromatography (GE Healthcare, Cat. No. 28990944) was used. The column was calibrated with protein molecular mass standards of Ferritin (Mr 440 000 kDa), Aldolase (Mr 158 000 kDa), Conalbumin (Mr 75 000 kDa), Ovalbumin (Mr 44 000 kDa), Carbonic anhydrase (Mr 29 000 kDa), Ribonuclease A (Mr 13 700 kDa). 150 µl filtered proteins (1.5 mg/ml) in PBS were used for analysis. Protein was eluted by DPBS buffer at a flow rate of 0.5 ml/min.

Membrane Proteome Array Assay. Integral Molecular, Inc. (Philadelphia, PA) performed specificity testing of V_H-Fc ab8 using the Membrane Proteome Array (MPA) platform. The MPA comprises 5,300 different human membrane protein clones, each overexpressed in live cells from expression plasmids that are individually transfected in separate wells of a 384-well plate (Tucker et al., 2018). The entire library of plasmids is arrayed in duplicate in a matrix format and transfected into HEK-293T cells, followed by incubation for 36 h to allow protein expression. Before specificity testing, optimal antibody concentrations for screening were determined by using cells expressing positive (membrane-tethered Protein A) and negative (mock-transfected) binding controls, followed by flow cytometric detection with an Alexa Fluor-conjugated secondary antibody (Jackson ImmunoResearch Laboratories). Based on the assay setup results, V_H-Fc ab8 (20 µg/ml) was added to the MPA. Binding across the protein library was measured on an iQue3 (Ann Arbor, MI) using the same fluorescently labeled secondary antibody. To ensure data validity, each array plate contained positive (Fc-binding; SARS-CoV-2 S protein) and negative (empty vector) controls. Identified targets were confirmed in a second flow cytometric experiment by using serial dilutions of the test antibody. The identity of each target was also confirmed by sequencing.

QUANTIFICATION AND STATISTICAL ANALYSIS

For the mouse model, the statistical significance of difference between V_H-Fc ab8 treated and control mice lung virus titers was determined by the two-tailed, unpaired, student *t* test calculated using GraphPad Prism 7.0. A p value < 0.05 was considered significant. ** $p < 0.01$. For the mice lung viral titer after perfusion, viral RNA and hamster lung viral RNA, statistical significance was determined by the Mann-Whitney *U* test. A p value < 0.05 was considered significant. ns: $p > 0.05$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. For comparing V_H-Fc ab8 and IgG1 ab1 concentration, significance analysis was determined by the two-way ANOVA followed by Tukey test in GraphPad Prism 7.0. A p value < 0.05 was considered significant. ns: $p > 0.05$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, ****$p < 0.0001$.

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- A high-affinity human antibody domain, V_H ab8, specific for SARS-CoV-2 was selected
- V_H ab8 bound to all three S protomers competing with ACE2
- Bivalent V_H, V_H-Fc ab8, potently neutralized SARS-CoV-2 in vitro and in animals
- Small size and bivalency contribute to the high ab8 SARS-CoV-2 neutralizing potency

In brief summary:

A high-affinity human antibody domain, V_H ab8, specific for SARS-CoV-2 bound to all three S protomers competing with ACE2. The relatively small size and bivalency of V_H-Fc ab8 contributed to its high potency in two animal models of infection.

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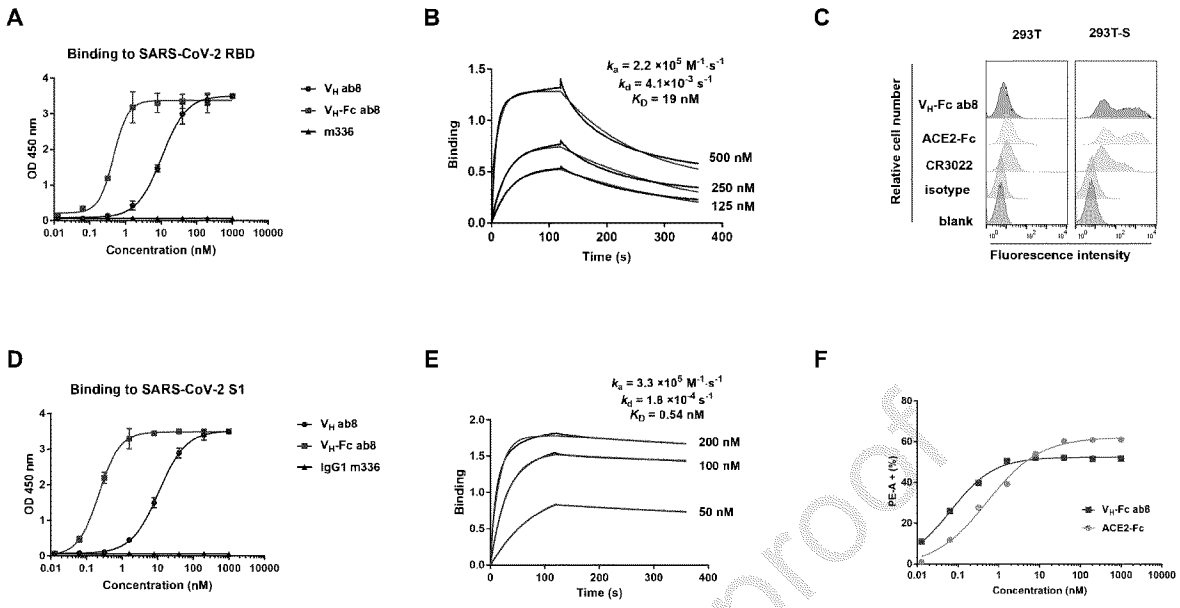

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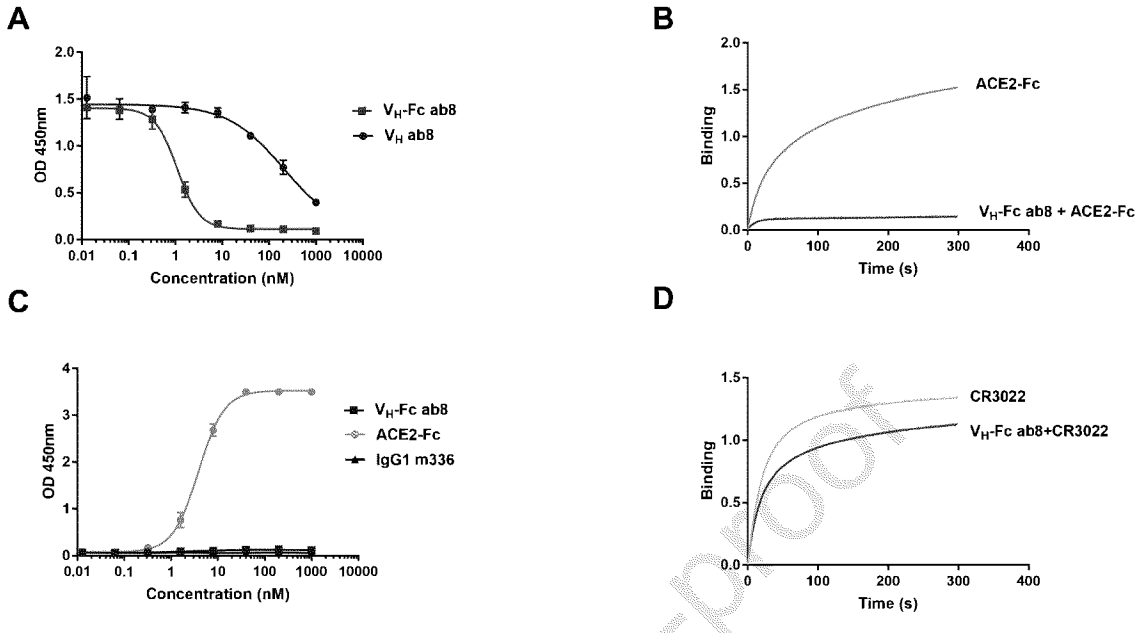

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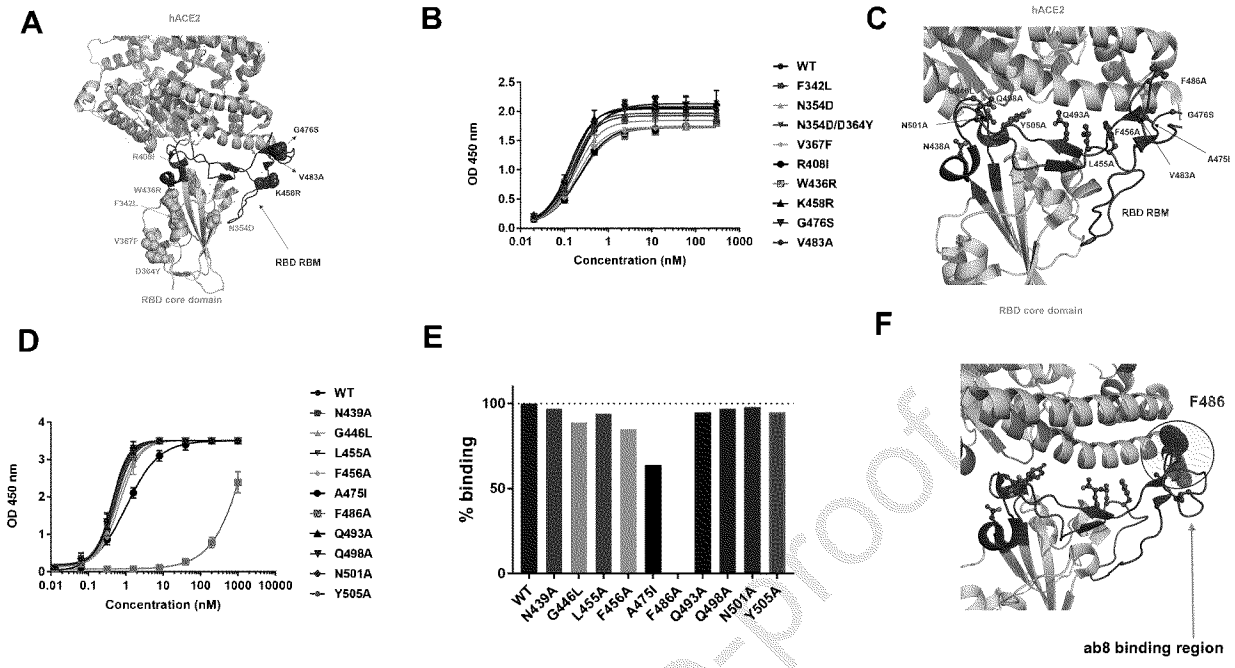

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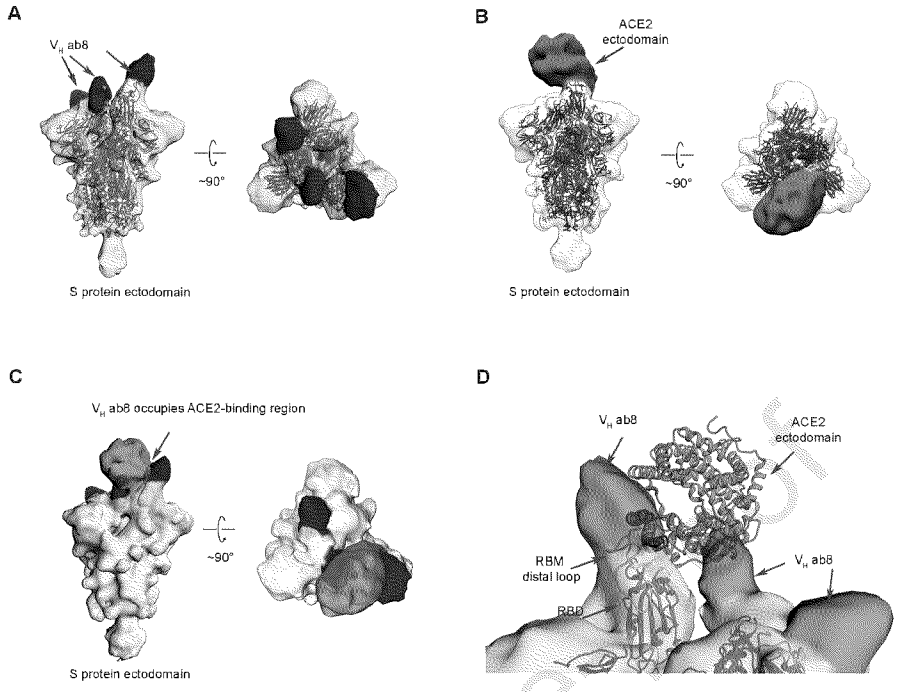

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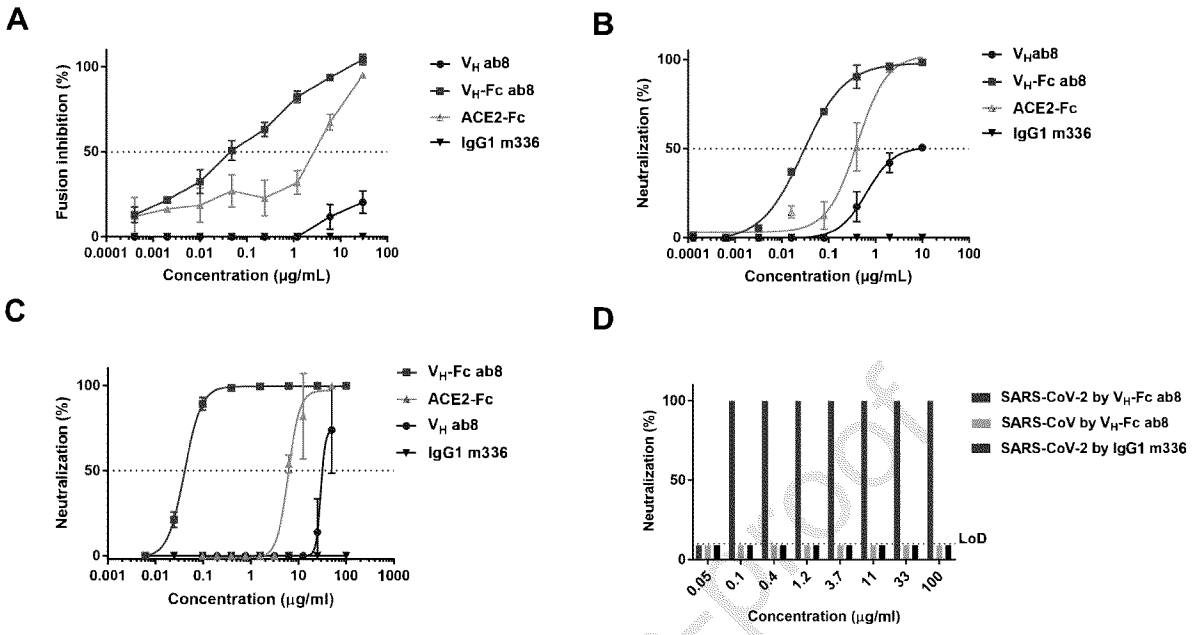

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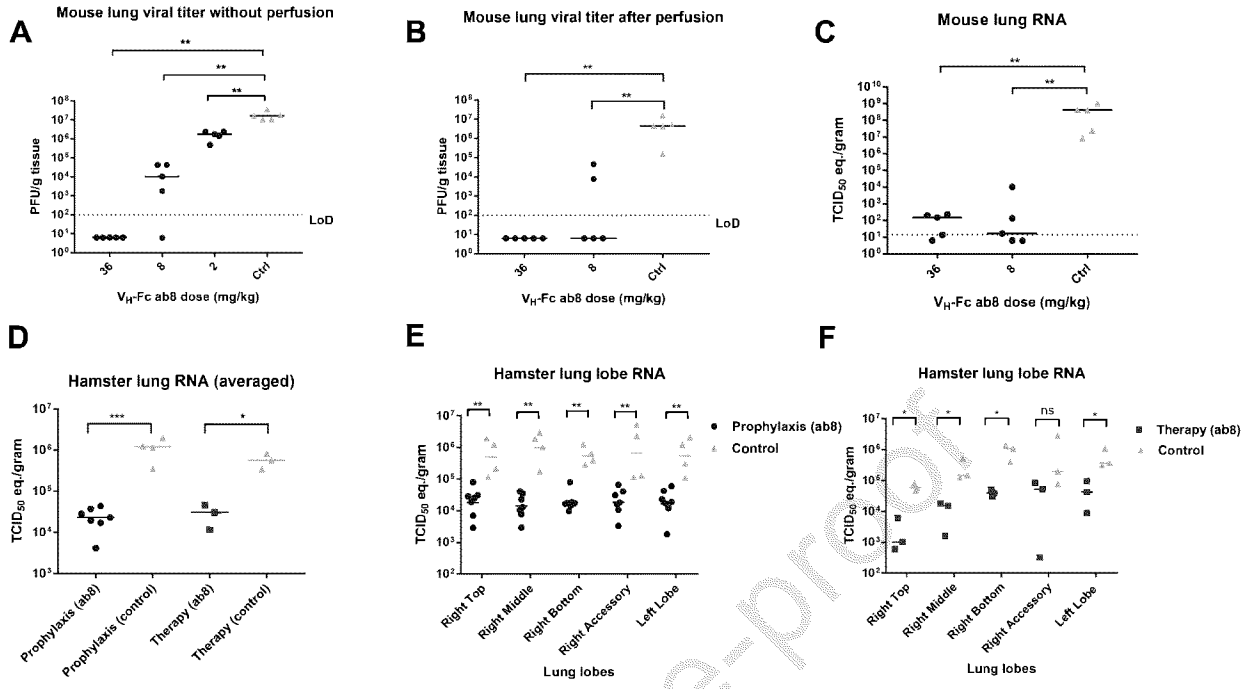

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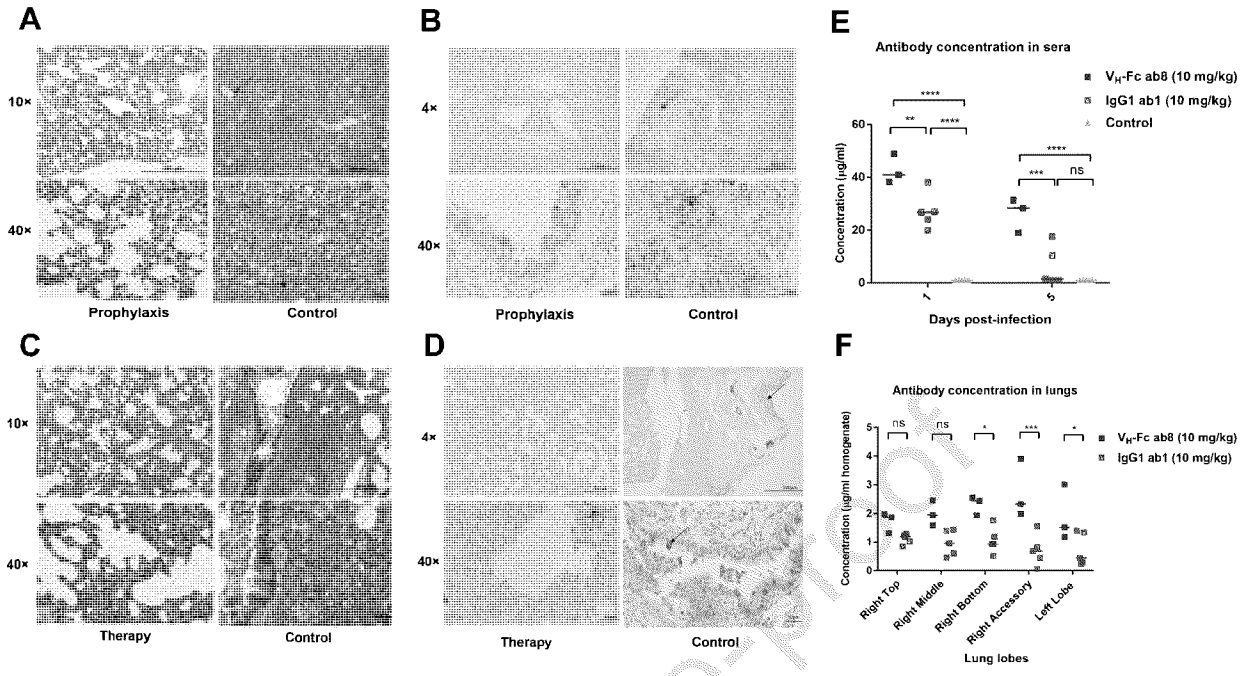

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Subject: [EXTERNAL] No call this week - WHO Working Group on COVID-19 Assays

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Hi All,

The WHO Working Group on COVID-19 Assays will not be held this week due to a conflict with the 2021 Global Vaccine and Immunization Research Forum (https://gvirf.org/).

Many thanks,
Lauren - Bill, Simon and César

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Subject: RE: WHO Working Group on COVID-19 Assays

Dear All,

Please find below the agenda for this week's WHO working group on COVID-19 assays group call.

Best,

Lauren - Bill, Simon and César

Agenda for WHO working group on COVID-19 assays group call Wednesday February 17 2:30PM CET (Geneva Time)

1. Ellie Barnes and Susie Dunachie (Oxford) - *Vaccine-induced immunity provides more robust heterotypic immunity than natural infection to emerging SARS-CoV-2 variants of concern*

2. Alex Sigal (AHRI) - *Cross-neutralization by plasma antibodies elicited by 501Y.V2 and earlier variants of 501Y.V2 and B.1.1 using live virus*

-----Original Appointment-----

From: SCHWARTZ, Lauren

Sent: Sunday, February 14, 2021 8:49 AM

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Subject: WHO Working Group on COVID-19 Assays
When: Wednesday, February 17, 2021 5:30 AM-6:30 AM (UTC-08:00) Pacific Time (US & Canada).
Where: https://who.zoom.us (b)(6)

Agenda to follow.

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CC: GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: EVD DRC USG SitRep 2_10 Aug 2018

Attachments: EVD DRC USG SitRep 2_10 Aug_2018.docx

Dear Colleagues,

The second USG SitRep for the DRC EVD outbreak in North Kivu Province is attached. Thanks as always to those that contributed information. The next USG sitrep will be distributed on Tuesday 14 Aug. Please provide information by 3 PM on Monday 13 August. Thank you.

Best,
Ray

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Democratic Republic of Congo (DRC) Ebola

USG SitRep #2

10 August 2018

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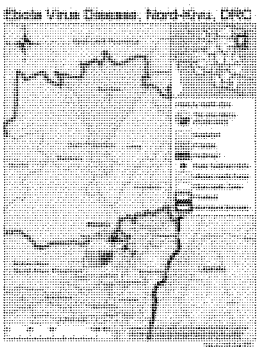
21	27	48	51	38	747 / 818 **(91 %)**
Confirmed Cases	**Probable Cases**	**Total Cases** (Conf+Prob)	**Suspected Cases**	**Deaths**	**Contacts** Followed/Total (%)

Provisional Case Counts - DRC CNC information at close of 10 August 2018. Cases will be reclassified and possibly removed as data validation continues. The numbers shown in red reflect change in counts over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 30 July 2018 the Ministry of Health (MoH) of Democratic Republic of Congo (DRC) first announced an outbreak of febrile illness in the province of Nord-Kivu. On 1 August, MOH announced that results from four of the six lab samples tested by National Institute for Biomedical Research (INRB) in Kinshasa were positive for Ebola virus. Since the outbreak began, confirmed and probable cases have been reported in six health districts of two provinces. Investigations and data cleaning are in progress to verify the working case counts. The completed sequencing results indicate that while the viral strain is *Zaire ebolavirus*, slight differences set the strain detected in Nord Kivu apart from the strain found earlier in Equateur. Security concerns affect the current outbreak area. Outbreak response activities are ongoing.



Double click to enlarge map

Epi/Surveillance

Province	Location	Cases				Deaths	Contacts		
		Confirmed	Probable	Total (C+P)	Suspected	Total	# Followed	Total	% Followed
Nord Kivu	Beni	4	0	4	15 (+2) (-9)	2 (+1)	131 (+16)	142 (+24)	92 (-5)
	Butembo	0	2	2	0	2	0	0	
	Oicha	0	1	1	0	1	0	0	
	Mabalako	17 (+4)	21	38 (+4)	36 (+6)	30	565 (+224)	616 (+186)	92 (+12)
	Musienene	0	1	1	0	1	0	0	
Ituri	Mandima	0	2	2	0	2	51 (+12)	60 (+21)	85 (-15)
Total		**21** (+4)	**27**	48 (+4)	**51** (+8) (-9)	**38** (+1)	**747** (+252)	**818** (+231)	**91** (+7)

Provisional Case Counts - DRC CNC information at close of 10 August 2018. Cases will be reclassified and possibly removed as data validation continues. The numbers shown in red reflect change in counts over past 24 hours.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi:

- As of 10 August the combined total of confirmed and probable cases has increased to 48 distributed in six health zones in two provinces.
- In Nord-Kivu province, the majority of cases are from Mabalako, with additional cases reported from Beni, Butembo, Oicha, and Musienene.
    - Four new confirmed cases have been reported over the last 24 hours in Mabalako HZ.
    - On 8 August, one confirmed case was reported in Beni. The case died following admission to the treatment unit. An investigation is underway to assess whether there was contact with confirmed or probable cases.
    - The above case and three earlier confirmed cases reported from Beni are cases that have been transported to the ETU in the city and have not originated in the city.
- In Ituri Province, probable cases have been reported from Mandima HZ.
- The number of suspected cases continue to fluctuate as new suspected cases are reported and subsequently confirmed or ruled out with negative lab testing. To date, the number of suspected cases increased by eight to 51.
- One new death was reported among the confirmed cases (in Beni) for a total of 38 deaths (11 confirmed).
- Several suspected cases over the past few days have been ruled out with negative test results in the six affected areas. In addition, two suspected cases in Goma were also ruled out and are not shown in the table.
- Contact tracing has commenced. Preliminary information pending verification indicates 966 persons have been registered as contacts since May; however, a lower number of contacts at 818 have thus far been validated. A total of 747 (91%) in Beni, Mabalako, and Mandima are being followed as of 10 August.
- **Further investigations to clarify contact tracing numbers are in progress and may change. Additional information will be provided upon availability.**
- The MoH in Beni had a list of contacts that were in areas that neither government nor NGO actors could reach. WHO noted that half of the Health Facilities in Oicha Health Zone, already the location of several suspected cases, were not accessible to government actors including the MoH.

Surveillance:

- A possible suspect in Haut-Uele tested negative for Ebola virus by the mobile lab in Beni.
- A team of 7 additional epidemiologists and 1 data manager arrived in Beni on 8 August to support surveillance efforts.

Laboratory

- INRB has completed sequencing and confirmed *Zaire ebolavirus* is the agent responsible for this outbreak and that it differs from the virus in the Equateur outbreak.
- The mobile lab for Ebola testing has been functional in Beni since 2 August 2018. There are 2 GeneXpert machines with 4 modules each and it is reported that there is sufficient capacity and no pending specimens.
- There are plans to place a GeneXpert mobile lab for Ebola testing in Mangina and Goma in the coming week. INRB confirms that there are approximately 1,000 GeneXpert cartridges for Ebola currently in country.
- The INRB is working to deploy additional diagnostic capacities in Mangina, including conventional polymerase chain reaction (PCR), serology, hematology and biochemistry.
- The current MoH lab testing algorithm requires two negative PCR results on samples collected 72 hours apart to rule out EVD. There is a legitimate basis for this if the first sample is collected within 48 hours of symptom onset, but many suspected cases do not meet this criterion. CDC and other partners are encouraging the MOH to revise this protocol as it results in delays in clearing non-cases and results in the unnecessary use of lab supplies.
- Orasure, OraQuick diagnostic tests have been shipped to Geneva (750) and DRC (1,000).
- As of 10 August, BARDA has not received requests for additional therapeutics or diagnostic tests.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Case Management

- The accuracy of data being reported from triage units and temporary ETUs is currently being assessed. Verified data will be provided once available. ALIMA, MSF, and those providing direct care to suspected and confirmed cases in ETUs have been asked to provide accurate information.
- Per UNICEF, as of 8 August, a total of 16 children have been hospitalized in the Ebola treatment centers (ETC), including 11 children in Mangina health area of Mabalako health zone and 5 children in Beni health zone.
- The MoH and WHO are seeking a partner for the possible construction of a standby ETU in Goma; MSF Holland has declined. It will be located on the grounds of an old cholera treatment center at the Clinique de Goma.
- IMC and WHO conducted an evaluation of the application of IPC practices in HGR Beni; this occurred one week after hospital staff were trained.
- No new information was provided on whether the treatment protocol has been approved by the ethical committee, or what medications have been approved for compassionate use during this outbreak.
- Three of the therapeutic treatments are reported to be in Mangina as of 8 August. Remdesivir is pending due to cold chain issues. Information available is as below:
    - ZMapp – 15 treatment courses are in DRC
    - REGN-EB3 - 10 treatment courses in DRC
    - mAb114 – 10 treatment courses in DRC
- Per the proposed protocol, there will be teams at each ETU comprised of clinical experts from the national lab (INRB), MSF, ALIMA, WHO, and the care and treatment commission. These treatment teams will discuss each case individually to determine which treatment, if any, will be provided, according to the criteria in the protocol.

Vaccine/Research

- The vaccination commission received the approval of the ethics committee on 8 August.
- Some 560 doses of vaccines were transported from Kinshasa on 8 August, including 30 doses which have already been removed from the -80°C freezers and prepared for immediate use. A total of 3,220 doses of the rVSV-ZEBOV vaccine are currently available in the country. An agreement between the Gavi Alliance and Merck (which developed the vaccine) provides for additional doses of the vaccine, used under an investigational protocol, to be available.
- The Minister was present in Mangina for the launch of the vaccination campaign today (8 August) in Beni. The provincial Minister of Health and the provincial coordinator of the Expanded Program on Immunization (EPI) were the first two volunteers to be vaccinated, followed by the front-line health professionals at the Mangina Reference Health Center who had been in contact with the confirmed cases who had been vaccinated. Eleven healthcare workers were vaccinated.
- Vaccinations are scheduled to begin in Beni on 10 August.
- The at-risk individuals selected to receive the vaccine in the Democratic Republic of Congo are:
  (i) Health professionals who are directly exposed to the confirmed case of EVD in the affected health areas;
  (ii) People who have been in contact with confirmed cases of EVD;
  (iii) Contacts of these contacts.
- After receiving the vaccine, recipients will be followed up for a specified period of up to 3 months.
- Immunization activities were initiated by Congolese EPI vaccinators who had been trained by Guinean vaccinators during the previous outbreak in Equateur Province. Several teams of Guinean experts have returned to the DRC and will likely be in the field to provide support to local experts starting 10 August.
- Posters and information for the vaccination campaign have been translated into local languages.
- WHO provided logistical support to establish the cold chain conditions and equipment needed to carry out the vaccination.
- In addition, WHO facilitates consultations on protocols to be put in place as well as discussions with the vaccine manufacturer and national authorities.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- This is the second vaccination in response to an Ebola outbreak in the Democratic Republic of Congo this year. The first vaccination campaign took place in Equateur province from May to June 2018. A total of 3,481 people were vaccinated and there were no reports of vaccine recipients who developed EVD.
- FDA is discussing with the vaccine manufacturer (Merck) the most expeditious export options in case WHO decides to make the Merck investigational Ebola vaccine available in neighboring countries of the DRC under its EUAL procedure.
- WHO convened a call on therapeutics on 10 August 2018, in which INRB, FDA and NIAID participated. They discussed a randomized trial which would enroll across outbreaks; specific design elements and therapeutics candidates to be determined.
- See Case Management regarding therapeutic treatments in DRC.*

Psychosocial Issues, Communications & Social Mobilization

- Safe and dignified burials have commenced as of 3 August; thus far there have been no reports of refusals.
- Two safe and dignified burials were conducted in Mabalako on 8 August.
- Communication teams have been provided with 500 leaflets, 1000 posters, and 200 copies of messages with information regarding Ebola. Efforts are underway to map cases of resistance to Ebola response efforts.
- A Knowledge Attitudes and Practices (KAP) survey is planned to take place in 12 health areas (within the affected health zones).
- Brassimba Beer Company has loaned a vehicle with loudspeakers for communication activities. Also the national police have been provided with leaflets to distribute to communities in the affected health zones.
- An orphaned child has been identified in Mangina ETC. Preparations are being finalized to offer appropriate child protection care and psycho-social assistance to these children and their families.
- The Psychosocial Commission has been set up in Beni Health Zone, which includes seven clinical psychologists. The Standard Operations Procedures (SOP) on psycho-social assistance have been developed and approved by the commission.
- Two psychologists at the ETC in Beni Health Zone provided daily psychosocial assistance to 10 persons (7 contacts and 3 suspected cases).
- Eight psycho-social agents have been trained in Mangina Health Area of Mabalako health zone.
- 90 psychosocial agents have been identified, and will receive training on providing psychosocial support on 11-12 August 2018.
- CDC released a [HYPERLINK "https://www.cdc.gov/media/releases/2018/s0809-new-ebola-outbreak.html"] regarding support for outbreak response on 9 August.

Response & Coordination

- [HYPERLINK "http://www.who.int/emergencies/crises/cod/DRC-ebola-disease-outbreak-response-plan-10august2018-1612-EN.pdf?ua=1"]for the Response to the Ebola Virus Disease Epidemic in North Kivu Province was released by DRC MOH on 10 August and includes a request for $43.8 million for response efforts.
- USAID provided $1 million to the World Health Organization on 8 August 2018, as an initial contribution to the outbreak response. USAID will provide additional resources to support the National Plan for the Response to Ebola.
- The National Head of Medical Care, has arrived in Goma where he will assist the Provincial Health Division of North Kivu to put in place a contingency plan in case Ebola reaches the provincial capital. The first pillars of the response to Goma have been activated, including:
    - Identification of a transitional isolation unit at the North Kivu Provincial Hospital (Goma),
    - Border health officers began to be deployed at various entry points in the city
    - Social mobilization is underway to raise awareness about the disease and prevention methods
- The response coordination mechanism is operational in Beni under the leadership of the Ministry of Health.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- The Emergency Operations Centre (EOC) in Beni is now functional with the presence of the Government, UNICEF, WHO and partners. On the UN side, the Deputy Humanitarian Coordinator is deployed in Beni to support coordination.
- USAID/OFDA attended two MoH meetings on 10 August at the Provincial Health Department (DPS – Département Provincial de Santé) in Goma and noted that the Contingency Plan for the Ebola outbreak for the southern part of North Kivu (Petit Nord) was still at a very early stage.
- CDC Director and USAID Deputy Assistant Administrator will travel to Goma and Beni in North Kivu next week.
- MoH will continue to have regular CNC meetings at 3 PM daily and at 11 AM on Sunday.

WASH

- OXFAM and UNICEF are ensuring that multiple handwashing stations are available at health centers in Mangina.
    - Installation of 29 handwashing points in public places (restaurants, parking places, churches) and in 15 "Formations Sanitaires" (FOSA) (health centers) in Beni, Mandima, and Mabalako Health Zone.
    - Chlorination of one water reservoir and the installation of 24 chlorination points in Mabalako Health zone (Mangina and Mapekele health area).
    - 68 actors in the General Hospital in Beni and ten members from the prevention commission were briefed on Ebola prevention measures and standards.
    - 16 traditional practitioners were briefed on Ebola prevention methods, of which 15 received handwashing buckets and a total of 15kg of chlorine in Beni Health Zone.

Border Health (BH)

- The [HYPERLINK "https://wwwnc.cdc.gov/travel/notices/watch/ebola-democratic-republic-of-the-congo"] regarding EVD outbreak in DRC was posted live on 8 August, at Watch - Level 1, Practice Usual Precautions.
- CDC has touched base with US NGOs (MSF, Samaritan's Purse, and Partners in Health) who have supported EVD patient care in past responses.
    - Of the 3, only MSF currently has plans to support EVD patient care activities during the response and will institute MSF occupational medicine supported self-monitoring for returning US based HCWs.
    - They will pro-actively connect with public health authorities in the jurisdictions where the person resides for awareness and coordination should the worker develop symptoms and require evaluation.
- CDC will have a call with the Peace Corps on Monday to discuss their guidance and communications for volunteers currently working in the border areas of Uganda across from the DRC outbreak location.

<u>DRC:</u>

- As of 8 August, 10,978 travelers were screened across 15 entry points.
- In total, 32 entry points have been identified for screening, including Ndjili airport.
- A meeting was held between representatives of Uganda and DRC at the Kasindi border crossing on 6 August.

<u>Uganda:</u>

- CDC Uganda is actively supporting and engaged with Uganda MOH preparedness teams deployed in the bordering districts of Kasese, Bundibugyo, Ntoroko and Kabarole. CDC support is focusing on mapping risk areas and cross-border population patterns; reinforcing Ebola virus surveillance, early detection, response and containment capacity; and strengthening infection prevention and control at crossing points and in health facilities in high risk areas.
- The WHO representative is leading a team to the high risk districts to assess the readiness levels and capacities.
- There was a coordination meeting in Kasese attended by Uganda Red Cross, CDC, Africa Union CDC, Ministry of Agriculture Animal Industry and Fisheries and IDI that discussed updates on preparedness among others issues. The meeting noted that all response pillars are functional. Bwera border crossing was noted to have a lot of cross-border activities including direct transport to and from Beni which call for more vigilance.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- CDC plans to review and discuss the possibility of JMEDICC extending support to all high risk districts in the region.
- In Kasese district, the MoH and WHO teams started orienting health facility workers on EVD case definition, detection and reporting.
- All STOP Team members have been repurposed, oriented on EVD and positioned in the high risk districts to reinforce surveillance activities.
- CDC is working with UVRI to strengthen sample collection and packaging. In the meantime, WHO has provided vehicles for sample transportation to UVRI in case of suspected cases from all high risk districts.
- AFENET working with other teams focused on capacity building for case management including case definition and surveillance in health facilities.
- There is increased population movements into Uganda through Mpondwe border (Kasindi border in DRC) post for trade and security reasons.
- Screening of people from DRC at Mpondwe border crossing has started following preparation and training of people to carry out the activity; over 2300 travelers have been screened. Screening activities have not yet identified any indication of viral hemorrhagic fevers.
- Fifteen border workers (police, medics, immigration officers) at Bwera Border post were oriented on EVD by the MoH/WHO Rapid Response team. Screening will also be enhanced at the border.
- The Infectious Diseases Institute working with local authorities identified up to 12 un-gazetted crossing points (illegal entry points) in Kasese district. They also noted that community gathering on both sides of the border are common despite declaration of the outbreak. 25% of patients who utilize HIV services at Bwera hospital are also from DRC. There is therefore need for increased surveillance and screening for possible suspected cases.
- There is urgent need for mass production of surveillance tools for all health facilities in the region.
- UNICEF and MOH are working to provide EVD messaging to the public through radio; messages are also being transmitted to HCWs with transmission of two approved EVD messages to 52,946 HCWs in 5,684 facilities in 13 high-risk districts.
- The MoH and WHO teams assessed EVD case management preparedness at Bukuku and Kichwamba health facilities and identified several gaps. MSF has set up a temporary isolation facility at Bwera hospital.
- There is need for more Infection Prevention and Control logistical support in all the districts.
- World Food Programme (WFP) is preparing to support storage and logistics management in case of an outbreak.
- CDC Uganda technical staff and leadership participated in Uganda National Task Force Meeting focus. CDC Border Health staff provided an update on border health activities in priority districts to the National Task Force.
- CDC Uganda country office staff met with DoD – JMEDICC, IDI, MSF and partners to deliberate on coordination of activities and sites for visit by CDC Director.
- CDC supported UVRI VHF staff and WHO WR / leadership visited Bundibugyo formal border crossing.
- CDC Uganda technical staff will deploy to western border region to continue to advance border health screening and border surveillance; identification, prioritization and capacitation of border communities / facilities within priority district.
- CDC Border Health Staff will begin assessments of the Entebbe airport on 8/10.
- The Border Health field team in Kasese District completed 6 health care facility preparedness assessments and one Key Informant Interview about cross-border population movement with a District Commissioner for Security (an appointed position).

Rwanda:

- A productive first multi-stakeholder meeting of the National Ebola Response and Coordination team was opened by the Minister of Health and chaired by WHO on 7 August.
- A brief review of actions to date was held and a review of the identified gaps in the EVD Response Plan was conducted. This was followed by a donor discussion of potential support.
- MOH has activated temperature screening at 17 border crossings at the DRC and Ugandan borders including Lake Kivu crossings. MOH also maintains temperature screening at the Kigali International Airport.

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- In addition surveillance at health facilities has been reinforced, and initial communications targeting communities in nine high risk districts initiated.

Deployment & Logistics

- USAID has two staff members currently deployed in Kinshasa supporting the USAID in-country office through mid-August (17-24 August). A third staff member will be deployed to support the USAID in country office from 15-30 August and additional staff are being lined up to be deployed through the end of September.
- To date, nine CDC persons have deployed to support the outbreak response: 1 VSPB SME to DRC; 1 BH to Uganda; 1 GIS, 1 Ops, 1 VHF SME, 1 Communications, and 1 Data Management to Geneva; and 2 IPC to Uganda.
- Three additional CDC staff (2 Vaccine in DRC, 1 BH in Uganda), who were already on TDY when the outbreak began, will extend their stay in the region to provide additional support for the outbreak response.
- Two additional CDC persons (1 IPC in Uganda; 1 BH to Geneva) are slated to depart in the next few days.
- WHO HQ has requested eight CDC individuals to provide support to the IMST in Geneva; six have been filled and additional candidates are being sought. One of the requested functions, translation services, may be provided from Atlanta.
- Embassy Security conducting a security assessment of Beni, which will largely determine CDC's footprint in the affected area. No information has been provided from the security commission in the CNC as of 9 August. However it is understood that discussions are ongoing with MONUSCO, FARDC, and other stakeholders.
- OCHA notes that the security concerns around the Beni response, center around the tensions between the ADF (an armed opposition group around Beni) and the MONUSCO force. OCHA believes that ADF no longer view MONUSCO as a neutral party, which could limit the logistical role that MONUSCO plays in the response.
- In line with other humanitarian actors, WHO does not plan on relying on MONUSCO for logistics, as they did in the Equatorial Province outbreak. This decision is the result of the perception of MONUSCO in the Beni area as being a party to the conflict and not a neutral arbiter. As a result, they are in discussions with WFP/UNHAS on a contract for extensive logistical support to include aircraft and office space.
- UNHAS has a helicopter (the second deployed in the East) that will begin to operate from Beni on August 10th. This helicopter was funded by WHO and will support travel around Beni, including for medical evacuations as it will be equipped with the necessary isolation unit and staff to handle the evacuation of suspected Ebola cases. Additionally, WHO and UNHAS are in discussions for the addition of a 19 passenger capacity aircraft to increase the frequency of humanitarian flights between Goma and Beni. ECHO flight also reported that their air assets in Goma were increasing the frequency of flights between Goma and Beni on request. As a result, the number of weekly humanitarian flights to Beni from Goma could increase from 5 per week to 10-12 per week if all the additional resources are made available.
- Although GOARN security review is ongoing, it is not anticipated that there will be a rapid and large number of GOARN deployments to the region. Nevertheless, GOARN continues to receive offers for candidates to deploy; the priority for GOARN at this time is expertise in case management.
- Per WHO, as of 8 August, three charter cargo planes from Mbandaka arrived in Beni with a total of 23 tons of supplies. From USAID-funded stockpiles, WHO and FAO will provide approximately 10,000 personal protective equipment (PPE) kits, 10,000 heavy duty PPE kits (includes full body coverall, heavy duty gloves, goggles), 50,000 universal protection sets (surgical masks, face shields, gloves), disinfection materials, and other supplies.
- Per UNICEF, a total of 12 Ebola protection kits, 80 drums of chlorine - 25kg each, 19 motorcycles, six water tanks, and 500 thermometers have been deployed to support the response in Beni, Butembo, and Mabalako health zones.
- A UPS flight carrying 90 tons of UNICEF material has landed in Kigali, Rwanda on 8 August 2018 en route to Beni. The materials will be transported to Goma and Beni over the coming days to support UNICEF interventions in the affected areas.
- As of 8 August 2018, 17 UNICEF staff members from C4D, Infocom, Child Protection, Health and WASH have been deployed to the affected health zones in North Kivu province. Additional 16 C4D staff are currently under

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

recruitment to support UNICEF's interventions in risk communication, social mobilization and community engagement in North Kivu.

- VSAT Marlink installation will commence in Beni on 9 August and in Mangina on 9 August. Installation in Goma is pending confirmation that VSAT equipment was received.

Challenges

- The security situation in North Kivu is a main focus of response efforts. The outbreak area is one of the highest kidnapping threat areas in DRC.
- This outbreak occurs in a complex epidemiological and humanitarian context.
- There is heavy cross-border traffic and presence of transient populations (FARDC, MONUSCO, militia, civilians) as well as an influx of Congolese refugees from neighboring countries, including Uganda, Burundi and Tanzania.
- The country is experiencing several outbreaks including cholera, measles and monkeypox.
- DRC is experiencing a long-term economic and political crisis.

*Therapeutics:

***ZMapp:** Mapp Bio's ZMapp product is a combination of three humanized monoclonal antibodies that was evaluated in the PREVAIL II trial in West Africa and showed a trend in benefit but missed the primary endpoints due to the declining number of cases.

***Remdesivir GS-5734:** antiviral drug, IV administration, 10d course; evaluated in PREVAIL IV in survivors

***REGN-EB3:** a combination of three, fully human, monoclonal antibodies; has shown efficacy equivalent to ZMapp in non-human Primates (NHPs); has completed a Phase I.

***mAb114:** single human monoclonal antibody; protects NHPs with 1 dose given 5d after challenge; Phase 1 ongoing – well tolerated to date.

Abbreviations:

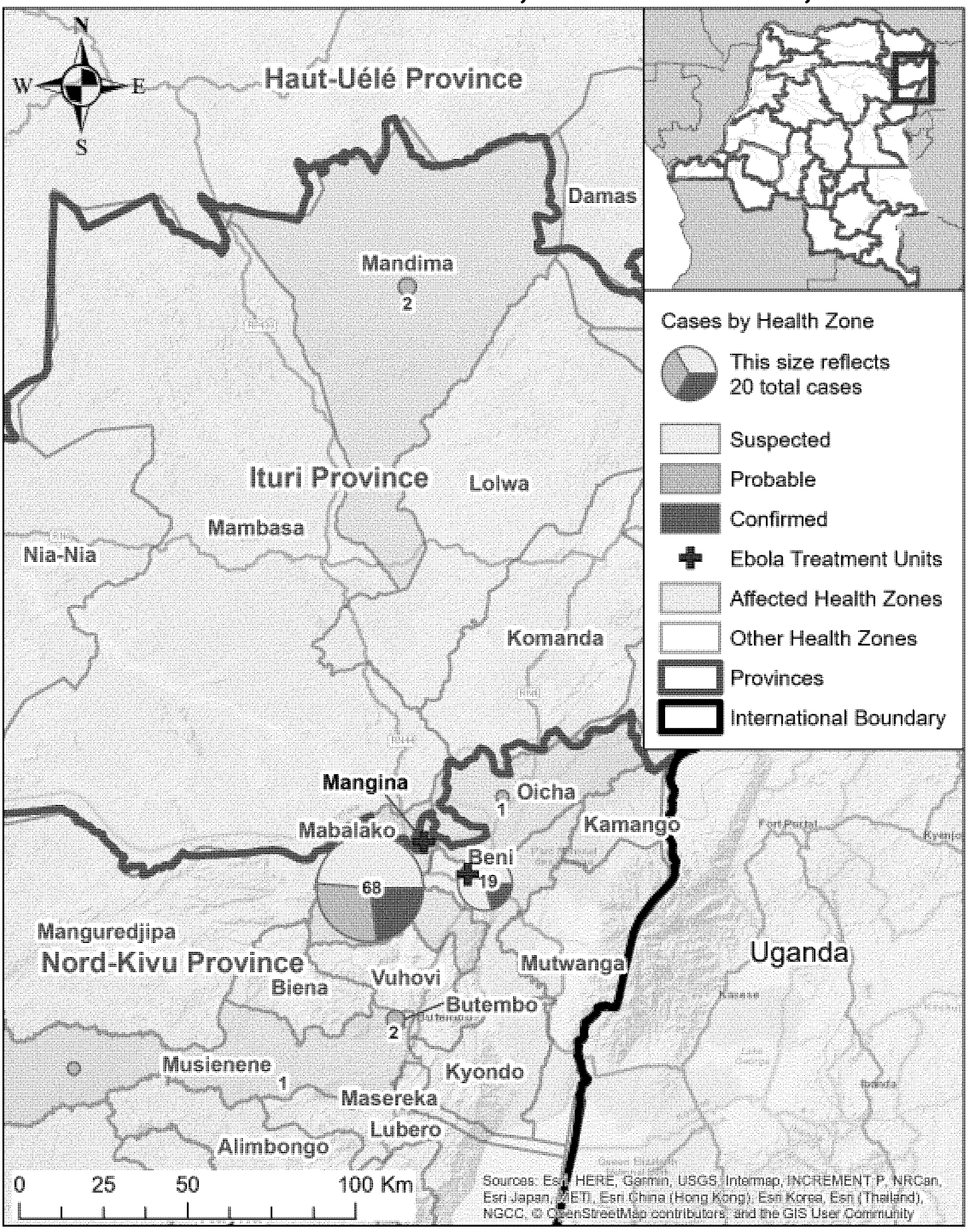
ACDC: Africa CDC
ADF: Allied Democratic Forces
ALIMA: Alliance for International Medical Action, medical humanitarian NGO
AFENET: African Field Epidemiology Network
C4D: UNICEF Communication for development
CFP: Case fatality proportion
CNC: Comité National de Coordination (National Coordination Committee)
CTE: Centre de traitement Ebola (Ebola Treatment Center)
CSR: Reference Health Center
ECHO: European Civil Protection and Humanitarian Aid Operations
ERT: Emergency Response Team
ETC/ETU: Ebola Treatment Center/Ebola Treatment Unit
EUAL: Emergency Use Assessment and Listing Procedure
EVD: Ebola Virus Disease
FARDC: Armed Forces of the Democratic Republic of the Congo GOARN: Global Outbreak Alert and Response Network
GOARN: Global Outbreak Alert and Response Network
HGR: General Referral Hospital
HZ: Health Zones
IDI: Infectious Diseases Institute (Uganda)
IFRC: International Federation of Red Cross and Red Crescent Societies
IMS: Incident Management Structure
IMST: Incident Management Support Team
INRB: Institut National de Recherche Biomédicale, Kinshasa, Democratic Republic of the Congo
IRC: International Rescue Committee
JMEDICC: The Joint Mobile Emerging Disease Intervention Clinical Capability
MONUSCO: Mission de l'Organisation des Nations Unies pour la Stabilisation en République Démocratique du Congo (United Nations Organization Stabilization Mission in the Democratic Republic of the Congo)
MSF: Médecins Sans Frontières; Doctors Without Borders
NHP: non-human primates
OST: Operational Support Team
PHEOC: Public Health Emergency Operations Centre
POE: Point of Entry
PopCAB: Population Connectivity Across Borders

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

RCT: Randomized Clinical Trial
SDB: Safe and Dignified Burials
STOP: Stop Transmission of Polio
UNHAS: United Nations Humanitarian Air Service
UNIC: United Nations Information Centre
UNICEF: United Nations Children's Fund

Sources: CDC, BARDA, DRC MoH, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Ebola Virus Disease, Nord-Kivu, DRC



Data as of 09 Aug 2018

From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 8/6/2018 6:29:31 PM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; Andrea Long-Wagar [alongwagar@usaid.gov]; andrew.p.hollands.civ@mail.mil; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Brownsteindp@state.gov; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; KampalaOutbreak@state.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; mailto:outbreak@usaid.gov [outbreak@usaid.gov]; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; outbreak@usaid.gov; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; roderick.davis3.mil@mail.mil; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
CC: GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC Ebola - USG SitRep 1_ 6 Aug 2018
Attachments: EVD DRC USG SitRep 1_6 Aug_2018.docx

Dear Colleagues,

CDC has prepared the attached sitrep at the request of the NSC. Thanks to those in the Interagency that contributed content.

Best,
Ray

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Democratic Republic of Congo (DRC) Ebola

USG SitRep #1

6 August 2018

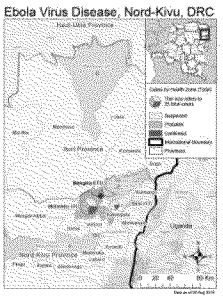
INTERNAL USG USE ONLY

74	16	27	31	34	0 / 966 (0 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

Provisional Case Counts - DRC CNC information at close of 6 August 2018. Cases will be reclassified and possibly removed as data validation continues. Details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 30 July 2018 the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) first announced an outbreak of febrile illness in the province of Nord-Kivu. On 1 August, MOHP announced that results from four of the six lab samples tested by National Institute for Biomedical Research (INRB) in Kinshasa were positive for Ebola virus. Since the outbreak began, confirmed and probable cases have been reported in six health districts of two provinces. Investigations and data cleaning are in progress to verify the working case counts. At this stage, there is no indication that this outbreak and the earlier epidemic in Equateur Province (declared over 24 July), separated by more than 2,500 km, are related. Security concerns affect the current outbreak area. Outbreak response activities are ongoing.



Double click to enlarge map

Epi/Surveillance

Province	Location	Cases				Deaths	Contacts		
		Confirmed	Probable*	Suspected	Total	Total	# Followed	Total	% Followed
Nord Kivu	**Beni**	3 (+3)	0	14 (+9)	17 (+12)	0	0	120	0
	Butembo	0	2	0	2	2	0	0	0
	Oicha	0	1	0	1	1	0	0	0
	Mabalako	13 (+9)	21 (+10)	17 (+2)	51 (+21)	28 (+9)	0	153	0
	Musienene	0	1	0	1 (+0)	1	0	0	0
Ituri	**Mandima**	0	2 (-3)	0	2 (-3)	2 (-3)	0	0	0
	Mambasa	0	0	0 (-5)	0 (-5)	0	0	0	0
Total		**16** (+12)	**27** (+10) (-3)	**31** (+11) (-5)	**74** (+25)	**34** (+6)	**0**	**966***	**0**

Provisional Case Counts - DRC CNC information at close of 6 August 2018. Cases will be reclassified and possibly removed as data validation continues. The numbers shown in red have changed since CNC information at close of 3 August. * **Do NOT distribute information regarding probable case count.**

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

Epi Overview:

- Investigations and data cleaning are in progress to verify the working case counts detailed below.
- As of the close of 6 August, the total number of cases had increased by 25 over the past three days to 74 (16 confirmed, 27 probable, 31 suspected). The number of deaths had also increased by six to 34 (CFP = 46%). The case counts by location as of 6 August are depicted in the table above and on the sitrep map today.
- The number of suspected cases is at 31. Clearly updated numbers for the count of probable cases and deaths were unavailable for 5 August; the values for these categories remain unchanged from 4 August. The overall case counts available as of 6 August are depicted in the sitrep dashboard today.
- Probable and confirmed cases have been reported from six health districts in two provinces. In Nord-Kivu province, the cases are predominantly from Mabalako, with additional cases reported from Beni (3 confirmed), Butembo, Oicha, and Musienene. In Ituri Province, probable cases have been reported from Mandima HZ. Of note, the category of probable cases includes all reported deaths for which it was not possible to obtain biological samples for laboratory confirmation. The investigations will determine whether these deaths are related to the epidemic or not.
- On 4 August, 879 contacts were reported to have been registered; on 5 August, the number of contacts identified had increased to 966; contact tracing is anticipated to soon begin.
    - It is not yet clear if the contact tracing teams will be accompanied by security. DRC Military (FARDC) and MONUSCO plan to accompany teams engaged in the response as needed for security, in plainclothes if necessary. Whether they will accompany the contact tracing teams is still under discussion.
    - Reportedly, after hearing awareness messaging at church or via the radio, persons with possible contact with Ebola cases are presenting themselves to the referral hospital in Beni and the referral clinic in Mangina for evaluation and being registered.
- Additional information regarding the early phase of the outbreak was released 5 August by MOHP press.
    - The case that alerted the provincial health authorities is that of a 65-year-old woman living in Mangina who had been hospitalized at the Mangina Reference Health Center (CSR) a few days before being discharged in mid-July.
    - She died at home a few days later. After her unsecured burial, the family members who cared for her began to show the same symptoms and seven of them died.
    - In reviewing patient records, local health authorities identified earlier sporadic community deaths. Ongoing investigations will determine whether these former community deaths have an epidemiological link between them.

Beni:

- Three new confirmed cases were reported on 4 August. These cases are reportedly all persons who initially developed symptoms in Mangina and then were transferred to Beni for care at the ETU run by MSF/France.

Mabalako:

- Six new confirmed cases were reported on 4 August. Three of the confirmed cases were in persons who were already deceased.
- Three new confirmed cases were reported on 5 August; one of whom is alive and two of whom were already deceased.

Surveillance:

- Surveillance commissions are being established according to the direction of MoHP to improve data on known and suspected cases, as well as tracking of contacts.
- Investigations are ongoing, with plans to test recently deceased suspect cases in order to confirm Ebola, if possible.

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

Laboratory

- Additional specimens for testing have been sent from new suspects currently hospitalized in Mangina and Beni; results are pending.
- INRB laboratory technicians set up a dedicated Ebola mobile laboratory in Beni, which has been operational since afternoon of Thursday, 2 August.
- There are plans to place a GeneXpert mobile lab for Ebola testing in Mangina in the coming week.
- With support from CDC and other non-USG partners, National Lab (INRB) staff were trained on use of GeneXpert for Ebola testing during last outbreak in June 2018.
- Information regarding viral sequence is still pending but preliminary results show that a number of Ebola Zaire "specific" PCR assays, with different targets, are positive.

Case Management

Current Ebola Treatment Unit (ETUs)*Patients	
Treatment Facility	**# Patients**
CSR Mangina (ALIMA)	1
HGR Beni (MSF/F)	3
Total	**4**

*Temporary treatment centers have been erected in two locations; the need for additional units is being assessed.

- MSF/France, which already has humanitarian activities in North Kivu, is running a triage center and Ebola Treatment Unit at the referral hospital in Beni (currently 2 tents). ALIMA has set up a triage/ETU in Mangina (Mabalako health zone) and is preparing a stand-by ETU in Goma if needed.
- At the Mangina Reference Health Center (CSR), one patient, a suspected case, is admitted; two suspected deaths were registered.
- At the Beni General Referral Hospital, three suspected cases are admitted.
- According to the MoHP, the first Ebola Treatment Centers (ETCs) will be located in Mangina (MSF France), Beni (ALIMA) and Goma (MSF Holland). Other CTEs could be installed depending on the evolution of the epidemic.
- There are two suspected cases in healthcare workers (HCW): one HCW in training has died and one nurse is currently hospitalized.
- During the prior outbreak, trainings and personal protective equipment (PPE) were provided by International Medical Corps (IMC), International Rescue Committee (IRC) and IFRC. Additional PPE was provided by many partners, including several funded by USG.
- An IMC-charted flight will deliver 300 sets of PPE—including coveralls, hoods, aprons, goggles, gloves, and gumboots—in the coming days for use by first responders. In addition, temporary medical structures that are part of the International Medical Corps' Emergency Field Hospital are already in Goma and could be utilized for treatment and isolation of Ebola patients, should it be needed.

Vaccine/Research

- Two -80°C freezers have arrived in Beni for appropriate storage of the vaccine.

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

- The vaccine commission has applied for an amendment to the prior ethical clearance (from the 9th outbreak) for the use of the vaccine. Approval is expected by mid-week.
- The MoHP reports that there are 3,220 doses of the Merck vaccine currently in Kinshasa; their expiration date is in September 2018. The MoHP plans to vaccinate front-line healthcare workers and implement the ring vaccination campaign of primary and secondary contacts, as done in the last outbreak.
- Under the auspices of its MOU with the WHO, NIAID is working with WHO R&D Blueprint staff and partners to design a therapeutics RCT for use in this outbreak. Design elements including specific countermeasures are still to be determined. No NIAID deployments are planned in the immediate future.

Psychosocial Issues, Communications & Social Mobilization

- International Federation of the Red Cross (IFRC) was the lead organization on the activity of Safe and Dignified Burials (SDB) during last outbreak and has stated their intent to resume this activity during the new outbreak. Collaborations with anthropologists and the communications commission during the prior outbreak helped to address concerns of the local population and improve acceptance of the practice. This collaborative approach will likely be used again.
- A communication strategy is being developed to increase awareness of the local population of the ongoing outbreak, signs and symptoms to look for, and how to prevent transmission.
- Communication will primarily be through radio messaging as well as information posted at health centers.

Response & Coordination

- The MOHP is leading the coordination at the national level and the Director General of the Division of Disease Control of the MoHP has been appointed as the coordinator of the response.
- Since the declaration of the epidemic on Wednesday, August 1, 2018, several rapid response teams from the MOHP have been sent to the city of Beni and the HZ of Mangina, epicenter of the current epidemic of Ebola.
- The MOHP, 12 members of the ministry, 16 members of WHO and representatives of several organizations, including OCHA, MONUSCO, DRC Military (FARDC), UNICEF, and World Bank completed a field visit in North Kivu on 2 August to assess the situation.
- The national level coordination would be organized around ten commissions (i) epidemiological surveillance (including contact tracing); (ii) patient care/management; (iii) laboratory examinations; (iv) communication; (v) water, hygiene, and sanitation; (vi) logistics (vii) psychosocial care; (viii) research, (ix) control of point of entry, (x) vaccination and (xi) security.
- The strategic plan for the response, including requests for funding, is being finalized.
- Beni has been identified by MOHP as the operation base for this initial response stage. Goma will be a secondary logistics hub for the transfer of personnel, with most of the cargo and supplies coming from Entebbe.
- Response operations are initiated with establishment of IMS in Kinshasa with a field coordination team in Beni.
- WHO has reactivated IMS support teams at the Regional Office and HQ level.
- WHO has provided technical and operations support to the MOHP and partners in the activation of a multi-partner multi-agency Emergency Operations Center to coordinate the response. Similar to the prior outbreak, the Minister of Health has announced that there will be operational centers in Kinshasa, Beni, and in each of the affected health zones, as needed.
- The Minister has specifically asked that a central database is kept of all organizations and personnel responding to the outbreak, and that any planned or actual financial donations to the outbreak are not publicized until confirmed and announced by his office.
- USAID/OFDA met with the Deputy Humanitarian Coordinator in Goma. The UN Office for the Coordination of Humanitarian Affairs (UNOCHA) — the key coordination body for the ongoing complex emergency humanitarian

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

response—will follow the same coordination model used in Equateur Province, where WHO and MoHP were in the lead for coordination and OCHA played a supporting role as requested by those entities. OCHA anticipates being to be asked to help with resource mobilization (fundraising), and information management and coordination support (meeting organization).

- USAID/OFDA currently funds health partners who provide emergency primary healthcare for conflict-affected populations in the affected area.
- USAID/OFDA continues to monitor the situation through coordination with USAID/Africa and USAID/GH Bureaus and is in discussions with current implementing partners to explore how existing programs can ensure protection of health care workers and avoid Ebola virus transmission at OFDA-supported facilities.
- The MoHP has announced that there will be daily CNC meetings at 3pm, the first of which was held 2nd August 2018.

WASH

- UNICEF is the lead technical member of commissions on communication, WASH (including Safe and Dignified Burials) and psychosocial care, and would also support the commissions on logistics and security.
- Safe and dignified burials have commenced as of 3 August.
- WHO reports that they have already provided 10 burial kits and several boxes of gloves.
- There is a lack of WASH supplies in the area.
- UNICEF indicates that health, water, sanitation and hygiene and communication supplies will be sent to the affected area in the coming days, including 300 laser thermometers to monitor the health conditions of people in the affected region and 2,000 kg of chlorine to treat water to help contain the spread of the disease.
- During the prior outbreak in Equateur, trainings and personal protective equipment (PPE) were provided by International Medical Corps (IMC), International Rescue Committee (IRC) and IFRC. Additional PPE was provided by many partners, including several funded by USG.

Border Health

- The plan for surveillance of points of entry is focused on 6 axes of travel, and the possibility of involvement of 2 additional provinces (Tshopo and South Kivu). There is concern for rapid spread to larger cities along transport corridors.
- Additionally there are 3 major border crossings to Uganda from Ituri and North Kivu.
- There is a reported need for additional equipment, including thermoflashes for POE teams.
- Cases have been identified in health zones approximately 30km from Beni, which is 50km from the Uganda border. The affected health zones are along the border between North Kivu and Ituri provinces.
- The province of North Kivu also shares a border with Rwanda.
- Work is ongoing to map air traffic flow out of the relevant nearby airports, including Entebbe in Uganda.
- Relevant USG staff, including USAID Missions, in both Uganda and Rwanda have been notified of the outbreak and will receive regular updates from USG staff in DRC.
- CDC is actively engaged in discussions with Ugandan health officials regarding how to support MOH efforts to heighten surveillance in the border region adjacent to DRC.
    - CDC DGMQ staff in Uganda provided border risk mapping and Population Connectivity Across Borders (PopCAB) training to MoHP, PHEOC, AFENET, national rapid response team members, and Baylor/IDI (USG implementing partners in Ft. Portal area) staff on 3 August.
    - DGMQ staff is assisting as part of Uganda National rapid response team assessment of Uganda border with DRC.

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

- U.S. Embassies Kinshasa and Kigali have issued Health Alerts to advise U.S. citizens of the Ebola outbreak in the DRC.
- CDC Traveler's Health is preparing a Travel Notice for the current outbreak in DRC

Deployment & Logistics

- DG ECHO health partners in the area are ready to intervene and the Commission's humanitarian air service 'ECHO Flight' is transporting medical staff and material from Goma to Beni.
- UNICEF has deployed a team of five staff members to Beni for the response, including two health specialists, two communication specialists and one water, sanitation and hygiene specialist from the Ebola-response team in the Province of Equateur. Additional deployment from the head office of Kinshasa, and the field offices of Goma, Bunia and other locations are being finalized.
- The GOARN OST is supporting partner coordination as part of the WHO Incident Management Support Teams, and will advise partners of any requests for assistance from the DRC MoHP.
- GOARN has not received request for technical assistance at this time, however, has sent out a preliminary call for support for response activities in Nord Kivu. Detailed needs for support are being identified in collaboration with Incident Management Teams in the WHO Country office for DRC, WHO Regional Office for Africa and WHO HQ. Pending a formal request for assistance, WHO is asking GOARN partners to identify experts who could be called upon for potential deployment.
- CDC is putting together a deployment and staffing plan in preparation for providing support to the MOHP and WHO as appropriate.
    - As of 6 August, two CDC staff will be deployed in response to the Ebola outbreak in DRC.
        - One senior CDC Viral Special Pathogens Branch (VSPB) subject matter expert (SME) is planning to deploy 6 August to Kinshasa to support response activities for approximately four weeks.
        - One senior CDC VSPB SME is planning to deploy 6 August to Geneva, Switzerland as a liaison to support WHO functions of the Incident Management Support Team (IMST).
    - CDC deployments to Uganda and Rwanda are planned for preparedness support to the MoHs and include border health and infection prevention and control activities.
    - One Division of Global Migration and Quarantine (DGMQ) border health SME is planning to deploy 8 August to support Uganda MOH with border POE assessments, population movement mapping, and border surveillance strategies.
- USAID has two staff members currently deployed in Kinshasa supporting the USAID in country office through mid-August (17-24 August). A third staff member will be deployed to support the USAID in country office from 15-30 August.
- OCHA reports that they have dedicated a vehicle to assist with transportation in the area.
- MONUSCO and WFP will organize flights and warehousing of supplies in Beni, and will also be involved in security commissions.
- OCHA notes that the security concerns around the Beni response, center around the tensions between the ADF (an armed opposition group around Beni) and the MONUSCO force. OCHA believes that ADF no longer view MONUSCO as a neutral party, which could limit the logistical role that MONUSCO plays in the response.
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Challenges

- The security situation in North Kivu is a main focus of response efforts. The outbreak area is one of the highest kidnapping threat areas in DRC.

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

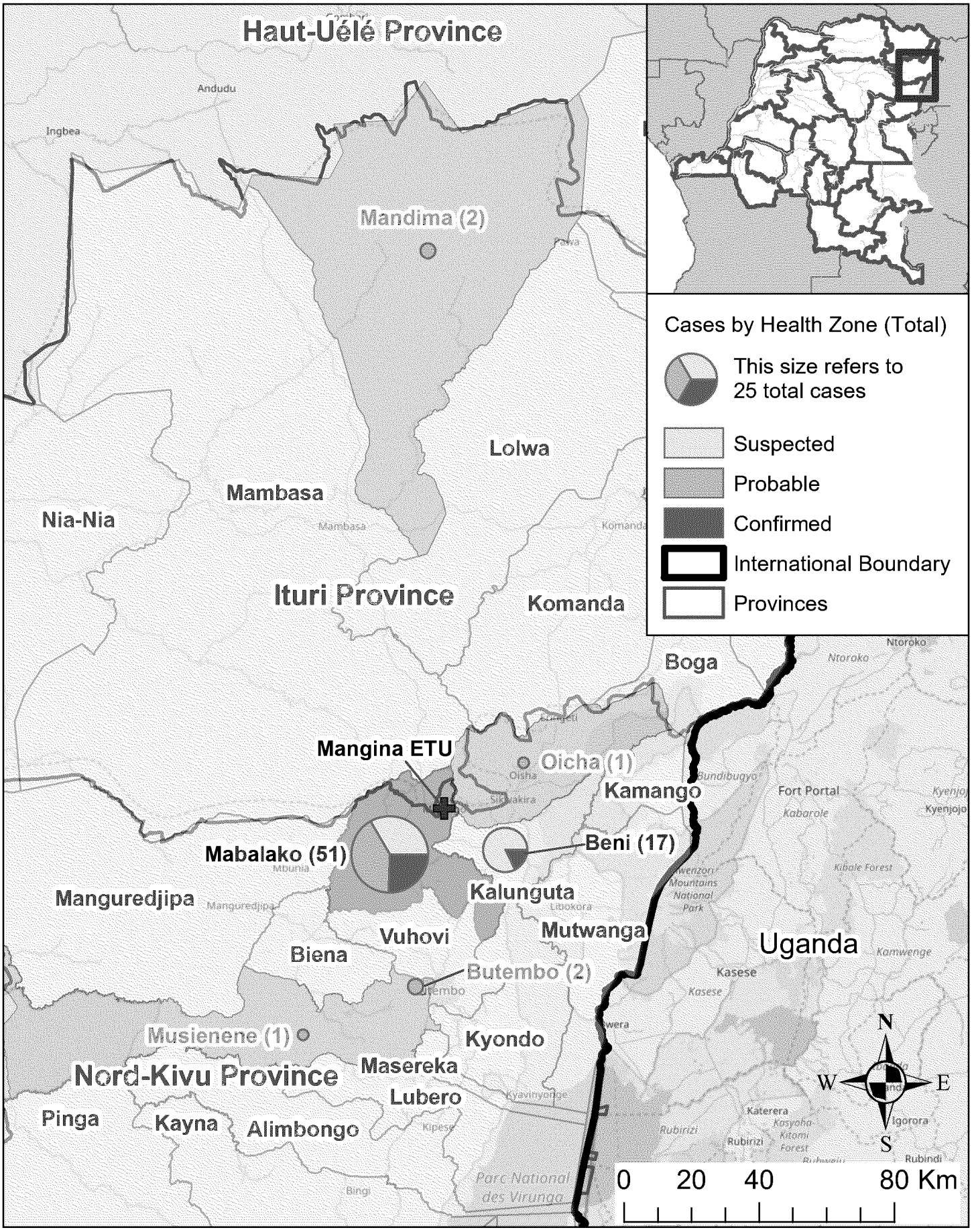
- This outbreak occurs in a complex epidemiological and humanitarian context.
- There is heavy cross-border traffic and presence of transient populations (FARDC, MONUSCO, militia, civilians) as well as an influx of Congolese refugees from neighboring countries, including Uganda, Burundi and Tanzania.
- The country is experiencing several outbreaks including cholera, measles and monkeypox.
- DRC is experiencing a long-term economic and political crisis.

Abbreviations

ACDC: Africa CDC
ADF: Allied Democratic Forces
ALIMA: Alliance for International Medical Action, medical humanitarian NGO
AFENET: African Field Epidemiology Network
CFP: Case fatality proportion
CNC: Comité National de Coordination (National Coordination Committee)
CSR: Reference Health Center
ECHO: European Civil Protection and Humanitarian Aid Operations
ERT: Emergency Response Team
ETC/ETU: Ebola Treatment Center/Ebola Treatment Unit
EVD: Ebola Virus Disease
FARDC: Armed Forces of the Democratic Republic of the Congo GOARN: Global Outbreak Alert and Response Network
GOARN: Global Outbreak Alert and Response Network
HGR: General Referral Hospital
HZ: Health Zones
IFRC: International Federation of Red Cross and Red Crescent Societies
IMS: Incident Management Structure
IMST: Incident Management Support Team
INRB: Institut National de Recherche Biomédicale, Kinshasa, Democratic Republic of the Congo
IRC: International Rescue Committee
MONUSCO: Mission de l'Organisation des Nations Unies pour la Stabilisation en République Démocratique du Congo
MSF: Médecins Sans Frontières; Doctors Without Borders
OST: Operational Support Team
PHEOC: Public Health Emergency Operations Centre
POE: Point of Entry
PopCAB: Population Connectivity Across Borders
RCT: Randomized Clinical Trial
SDB: Safe and Dignified Burials
UNHAS: United Nations Humanitarian Air Service
UNIC: United Nations Information Centre
UNICEF: United Nations Children's Fund

Sources: CDC, Department of State, DRC MoHP, GOARN, NIAID, USAID, WHO

Ebola Virus Disease, Nord-Kivu, DRC



Data as of 05 Aug 2018

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Daniel, Katherine L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c1f217e1320f41839e073f4a00529a52-HHS-kdl8-cd]; Kennedy, Beth D CTR OSD OUSD POLICY (US [beth.d.kennedy.ctr@mail.mil]; Kishimori, Jennifer M COL USARMY OSD HA (US [jennifer.m.kishimori.mil@mail.mil]; Krystal.L.Murphy2.mil@mail.mil; kschoenholz@usaid.gov; laarmstrong@usaid.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; LeButt, Kimberly A CIV OSD OUSD ATL (US [kimberly.a.lebutt.civ@mail.mil]; Lee, Kaye A [LeeKA@state.gov]; Lim, Matthew L CAPT USN BUMED FCH VA (US [matthew.l.lim.mil@mail.mil]; Maher, Carmen T CIV USARMY DOD JPEO CBRND (US [carmen.t.maher.civ@mail.mil]; Malac, Deborah R (Kampala [MalacDR@state.gov]; Mamacos, Peter D. EOP/NSC (b)(6) @nsc.eop.gov]; Mantiply, William M (Marshall) CIV JS J5 (US [william.m.mantiply.civ@mail.mil]; Marinissen, Maria Julia (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5bad48dfabf84875995b2cad6a6bf46f-HHS-Maria.M]; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; mark.j.swayne.civ@mail.mil; McCormack, Ryan E LTC USARMY JS J3 (US [ryan.e.mccormack.mil@mail.mil]; Mcquiston, Jennifer H (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=190b74b90fb442abbbd190f05337f176-HHS-fzh7-cd]; Harvey, Melissa (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=539ca2f0c7374f13b08ac28df51db91d-HHS-Melissa]; Metcalf-Kelly, Maura CTR DHA HEALTH SURV (US [maura.metcalf-kelly.ctr@mail.mil]; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; Michaels, Richard C [MichaelsRC@state.gov]; Millard, Christopher A CIV OSD OUSD POLICY (US [christopher.a.millard.civ@mail.mil]; Wolfe, Mitchell (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6a21848015074b41965a8925c65edf21-HHS-msw6-cd]; Music, Chris G. EOP/OMB (b)(6) @omb.eop.gov]; MUSIC, FRANCESCA Christy CIV OSD OUSD POLICY (US [francesca.c.music2.civ@mail.mil]; ncmiops@ncmi.detrick.army.mil; Pesik, Nicolette (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7b1e1130b4d8487493370ef02e475901-HHS-ndp9-cd]; Nichol, Stuart T (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b9c163136088456ab15b5378d90948b0-HHS-stn1-cd]; ofdaafricom@ofda.gov; Overby, Lee T COL USARMY JS J3 (US [lee.t.overby.mil@mail.mil]; Pandemic-Response-OES@state.gov; Peter.E.Matthews.mil@mail.mil; Petersen, Kyle [kpetersen@peacecorps.gov]; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Piansay, Joseph E CDR USN OSD OUSD POLICY (US [joseph.e.piansay.mil@mail.mil]; Raghunathan, Pratima L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bcde7aa4e4a04ba6b0f598c7d35c276d-HHS-pgr4-cd]; rarthur@cdc.gov; Arthur, Ray R (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e50d6b58fc6a4fd4ab2dfd07b5a93f33-HHS-rca8-cd]; Redd, John T (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e7708e6ade5e40f08548507bfafc25bd-HHS-jvr2-cd]; Khabbaz, Rima F (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ecfe700f891447b189ffd27df8ac26e1-HHS-rfk1-cd]; rgreene@usaid.gov; Rollin, Pierre (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5eac15e024294bf7b4f6b6273669ce64-HHS-pyr3-cd]; Rotz, Lisa D (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b77a22d3468c4b46b0ffa72e818e1cb4-HHS-ler8-cd]; Martin, Rebecca (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4e628afc6bfb4cdda47afdbadcd49be5-HHS-rtm4-cd]; Sahley, Caroline M. EOP/NSC [(b)(6) @nsc.eop.gov]; Phillips, Sally (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1cb037be9832427da73afb313d34e243-HHS-Sally.P]; Sampson, Aaron B (Kinshasa [SampsonAB@state.gov]; Scovitch, Joseph R [ScovitchJR@state.gov]; Sekowski, Andre E CIV OSD OUSD POLICY (US [andre.e.sekowski.civ@mail.mil]; SES-O_CMS@state.gov; Solomon, Jobe CIV OSD OUSD POLICY (US [jobe.solomon1.civ@mail.mil]; Sonali Korde [skorde@usaid.gov]; spaige@usaid.gov; Stahlman, James [James.e.stahlman.civ@mail.mil]; steven.j.donnelly@cbp.dhs.gov; Bunga, Sudhir (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9ae5fb1ab4c6432ba52e1adf0d3ed446-HHS-hno1-cd]; Talento, Kathryn F. EOP/WHO [(b)(6) @who.eop.gov]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative

Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; 'TIPPINGE' [TIPPINGE@dni.gov]; tobertgm@state.gov; Tratensek, Alexander [TratensekA@state.gov]; Trigilio, John J CIV OSD OUSD POLICY (US [john.j.trigilio.civ@mail.mil]; Tyler.A.Grunewald.mil@mail.mil; Ubiera, Juan I CIV DHA HEALTH SURV (US [juan.i.ubiera.civ@mail.mil]; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Velasquez, Orlando T. EOP/NSC [(b)(6)]@nsc.eop.gov]; Vrooman, Peter (Kigali [VroomanP@state.gov]; WaltersWA2@state.gov; Watson, Ian D. EOP/OSTP [(b)(6)]@ostp.eop.gov]; White, Duvel William (Bill) CIV DHA HEALTH SURV (US [duvel.w.white.civ@mail.mil]; Wilmer, Jack W. EOP/OSTP [(b)(6)]@ostp.eop.gov]

Subject: Ebola Sync Call notes: 12/20/2018

For Official Use Only

Dear Colleagues,

Attached, for your records, are the notes from Ebola sync call.

I hope you have a nice weekend and holiday break, knowing very well that most of you will be working during the break. Thank you for your service.

Our next call will take place on Wed, Dec. 26, 8:30 am ET.

v/r,
Lu

(b)(5)

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ATTACHMENT: none

From: Borio, Luciana L. EOP/NSC [(b)(6)@nsc.eop.gov]
Sent: 10/25/2018 12:21:26 PM
To: Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; alongwagar@usaid.gov; Anthony.Macintyre@hq.dhs.gov; Barna, Lauren (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=271142eac37342bf97e640c7903bb7a1-HHS-Lauren.]; Bergmann, Julie N CTR OSD OUSD POLICY (US [julie.n.bergmann.ctr@mail.mil]; bhaberer@usaid.gov; Boles, Cassie L. EOP/OMB [(b)(6)@omb.eop.gov]; Bulgrin, Julie K. EOP/NSC [(b)(6)@nsc.eop.gov]; Bunga, Sudhir (Juba [BungaS@state.gov]; Burton, Nicholas S. EOP/OMB [(b)(6)@omb.eop.gov]; CDC Info and Review Request [GDD-outbreak@cdc.gov]; Cetron, Martin (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0df896abcded4e5d91d79a34c4b49ce9-HHS-mzc4-cd]; Chau, Jason K. EOP/NSC [(b)(6)@nsc.eop.gov]; Braden, Christopher R (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b887b037ba8e4940a4ba50173d530c5f-HHS-crb5-cd]; Cincotta, Jacqueline V CIV JS (US [jacqueline.v.cincotta.civ@mail.mil]; Cole, Will P. EOP/OMB [(b)(6)@omb.eop.gov]; Cramer, Drew W. EOP/OMB [(b)(6)@omb.eop.gov]; ctocco@usaid.gov; Dahl, Benjamin A (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=390507b55b2f40f2a0691f0543763e09-HHS-bid5-cd]; Danner, Mark R COL USARMY JS J5 (US [mark.r.danner.mil@mail.mil]; Daumit, Alexander (Jim) J. EOP/OMB [(b)(6)@omb.eop.gov]; david.a.tarantino@cbp.dhs.gov; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; DL NSC Africa [DL.Africa@whmo.mil]; DL NSC BATS [DL.BATS@whmo.mil]; DL NSC Legal [DL.Legal@whmo.mil]; DL NSC Press [DL.Press@whmo.mil]; DL NSC Resilience [DL.Resilience@whmo.mil]; DL NSC WMD [DL.WMD@whmo.mil]; Sosin, Daniel M (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d4ba58d75824856aec1d927a500bce8-HHS-dms8-cd]; DRCEBOLARMT_Deputies@ofda.gov; duane.caneva@hq.dhs.gov; Suhr, Cristen (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=69ab742f0b004a5e8d6694e89c7d020c-HHS-dze0-cd]; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; Higgs, Elizabeth S (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0ac36dd643c04994b3161baf825cbfc3-HHS-ehiggs-]; Eleftherion, Anthony J. EOP/OMB [(b)(6)@omb.eop.gov]; Ellis Patrick A Mr NGA-AOQ USA CIV [Patrick.A.Ellis@nga.mil]; ericmk@dni.gov; Firoved, Aaron [aaron.firoved@HQ.DHS.GOV]; Garman, Patrick M COL USARMY JS OCJCS (US [patrick.m.garman.mil@mail.mil]; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; Hall, Bill (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4e56218361cd4ffbacdd06ac2d7b809d-HHS-bill.ha]; haskellj@state.gov; Ewetola, Raimi (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bb5588c39d0b444a85435a9c37ad006e-HHS-hcx6-cd]; Hepburn, Matthew [matthew.hepburn@darpa.mil]; hhs.soc@hhs.gov; Higgins, Melanie H [HigginsMH@state.gov]; hilary.marston@nih.hhs.gov; Hinds, K Allison (Dr.) CIV JS J3 (US [kathleen.a.hinds.civ@mail.mil]; Hogan, James J (Kinshasa [HoganJJ@state.gov]; Hollands, Andrew P CIV DTRA PARTNERSHIP AND INSP (US [andrew.p.hollands.civ@mail.mil]; Jafari, Hamid S (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7cb198bda13b4e26826d746fe22175e6-HHS-hsj0-cd]; HushekTJ@state.gov; Damon, Inger K (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=42b35bd733a34c66a5698f43f7026e88-HHS-iad7-cd]; jdorrance@ofda.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; Jensen, Kenneth W Lt Col USAF JS J5 (US [kenneth.w.jensen10.mil@mail.mil]; Jones, Steven P CIV OSD OUSD P-R (US [steven.p.jones10.civ@mail.mil]; Lamana, Joseph P (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9608ab2ee87f4b79ba753036e3d1f3e7-HHS-Joseph.]; jpendarvis@usaid.gov; Daniel, Katherine L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c1f217e1320f41839e073f4a00529a52-HHS-kdl8-cd]; Kennedy, Beth D CTR OSD OUSD POLICY (US [beth.d.kennedy.ctr@mail.mil]; Kishimori, Jennifer M COL USARMY OSD HA (US [jennifer.m.kishimori.mil@mail.mil]; Krystal.L.Murphy2.mil@mail.mil; kschoenholz@usaid.gov; laarmstrong@usaid.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group

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EOP/NSC (b)(6) @nsc.eop.gov]; Mantiply, William M (Marshall) CIV JS J5 (US [william.m.mantiply.civ@mail.mil]; Marinissen, Maria Julia (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5bad48dfabf84875995b2cad6a6bf46f-HHS-Maria.M]; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; mark.j.swayne.civ@mail.mil; McCormack, Ryan E LTC USARMY JS J3 (US [ryan.e.mccormack.mil@mail.mil]; Mcquiston, Jennifer H (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=190b74b90fb442abbbd190f05337f176-HHS-fzh7-cd]; Harvey, Melissa (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=539ca2f0c7374f13b08ac28df51db91d-HHS-Melissa]; Metcalf-Kelly, Maura CTR DHA HEALTH SURV (US [maura.metcalf-kelly.ctr@mail.mil]; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; Michaels, Richard C [MichaelsRC@state.gov]; Millard, Christopher A CIV OSD OUSD POLICY (US [christopher.a.millard.civ@mail.mil]; Wolfe, Mitchell (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6a21848015074b41965a8925c65edf21-HHS-msw6-cd]; Music, Chris G. EOP/OMB (b)(6) @omb.eop.gov]; MUSIC, FRANCESCA Christy CIV OSD OUSD POLICY (US [francesca.c.music2.civ@mail.mil]; ncmiops@ncmi.detrick.army.mil; Pesik, Nicolette (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7b1e1130b4d8487493370ef02e475901-HHS-ndp9-cd]; Nichol, Stuart T (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b9c163136088456ab15b5378d90948b0-HHS-stn1-cd]; ofdaafricom@ofda.gov; Overby, Lee T COL USARMY JS J3 (US [lee.t.overby.mil@mail.mil]; Pandemic-Response-OES@state.gov; Peter.E.Matthews.mil@mail.mil; Petersen, Kyle [kpetersen@peacecorps.gov]; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Piansay, Joseph E CDR USN OSD OUSD POLICY (US [joseph.e.piansay.mil@mail.mil]; Raghunathan, Pratima L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bcde7aa4e4a04ba6b0f598c7d35c276d-HHS-pgr4-cd]; rarthur@cdc.gov; Arthur, Ray R (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e50d6b58fc6a4fd4ab2dfd07b5a93f33-HHS-rca8-cd]; Redd, John T (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e7708e6ade5e40f08548507bfafc25bd-HHS-jvr2-cd]; Khabbaz, Rima F (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ecfe700f891447b189ffd27df8ac26e1-HHS-rfk1-cd]; rgreene@usaid.gov; Rollin, Pierre (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=5eac15e024294bf7b4f6b6273669ce64-HHS-pyr3-cd]; Rotz, Lisa D (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b77a22d3468c4b46b0ffa72e818e1cb4-HHS-ler8-cd]; Martin, Rebecca (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4e628afc6bfb4cdda47afdbadcd49be5-HHS-rtm4-cd]; Sahley, Caroline M. EOP/NSC (b)(6) @nsc.eop.gov]; Phillips, Sally (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1cb037be9832427da73afb313d34e243-HHS-Sally.P]; Sampson, Aaron B (Kinshasa [SampsonAB@state.gov]; Scovitch, Joseph R [ScovitchJR@state.gov]; Sekowski, Andre E CIV OSD OUSD POLICY (US [andre.e.sekowski.civ@mail.mil]; SES-O_CMS@state.gov; Solomon, Jobe CIV OSD OUSD POLICY (US [jobe.solomon1.civ@mail.mil]; Sonali Korde [skorde@usaid.gov]; spaige@usaid.gov; Stahlman, James [James.e.stahlman.civ@mail.mil]; steven.j.donnelly@cbp.dhs.gov; Bunga, Sudhir (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9ae5fb1ab4c6432ba52e1adf0d3ed446-HHS-hno1-cd]; Talento, Kathryn F. EOP/WHO (b)(6) @who.eop.gov]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; 'TIPPINGE' [TIPPINGE@dni.gov]; tobertgm@state.gov; Tratensek, Alexander [TratensekA@state.gov]; Trigilio, John J CIV OSD OUSD POLICY (US [john.j.trigilio.civ@mail.mil]; Tyler.A.Grunewald.mil@mail.mil; Ubiera, Juan I CIV DHA HEALTH SURV (US [juan.i.ubiera.civ@mail.mil]; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Velasquez, Orlando T. EOP/NSC

[(b)(6)@nsc.eop.gov]; Vrooman, Peter (Kigali [VroomanP@state.gov]; WaltersWA2@state.gov; Watson, Ian D. EOP/OSTP [(b)(6)@ostp.eop.gov]; White, Duvel William (Bill) CIV DHA HEALTH SURV (US [duvel.w.white.civ@mail.mil]; Wilmer, Jack W. EOP/OSTP [(b)(6)@ostp.eop.gov]

Subject: Ebola - eastern DRC - sync call notes 10.24.2018

For Official Use Only

Dear Colleagues,

Thank you for joining our sync call yesterday. Below are the notes from our call.

v/r,
Lu

(b)(5)

(b)(5)

(b)(5)

(b)(5)

(b)(5)

ATTACHMENTS: none

From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 5/29/2018 11:28:36 AM
To: roderick.davis3.mil@mail.mil; aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; (b)(6)@nsc.eop.gov; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
Subject: DRC Ebola USG sitrep 20 _ 29 May 2018
Attachments: DRC Ebola USG sitrep 20_29 May 2018.docx

Dear Colleagues,

The 29 May sitrep is attached. The next sitrep will be distributed on Friday 1 June, as per the usual schedule. Please provide any information to GDD-Outbreak@cdc.gov by 3 PM on Thursday.

Thank you.
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
Emergency Response and Recovery Branch

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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

29-MAY-2018

SITREP #20

INTERNAL USG USE ONLY

54	35	13	6	25	736 / 992 (74 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

Provisional Case Counts - Data as of 28 May 2018 in DRC. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

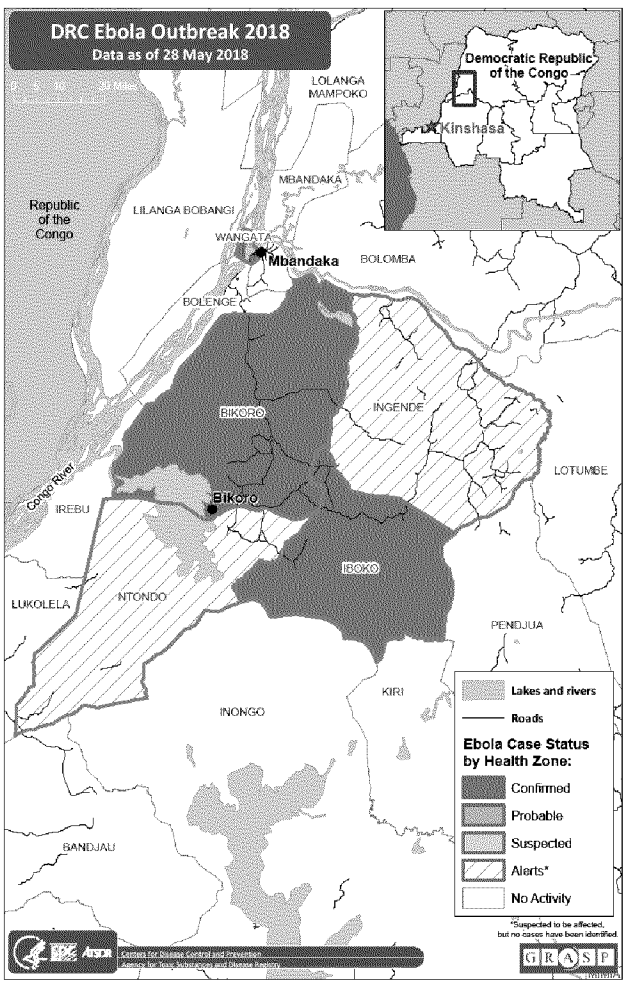
Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province, in Northwest DRC.

The three health zones reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). A suspected case in Ntondo HZ was reported over the weekend, however, has tested negative for EVD. Surveillance for cases, contact tracing and investigations continue in Mbandaka and with renewed focus on Iboko and Bikoro.

On Monday, May 21, 2018, the Minister of Health, Dr. Oly Ilunga Kalenga, launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak.

Vaccination efforts started in Bikoro and Itipo on 28 May. Vaccinations in Iboko are scheduled to begin 31 May.



Double click to enlarge map

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

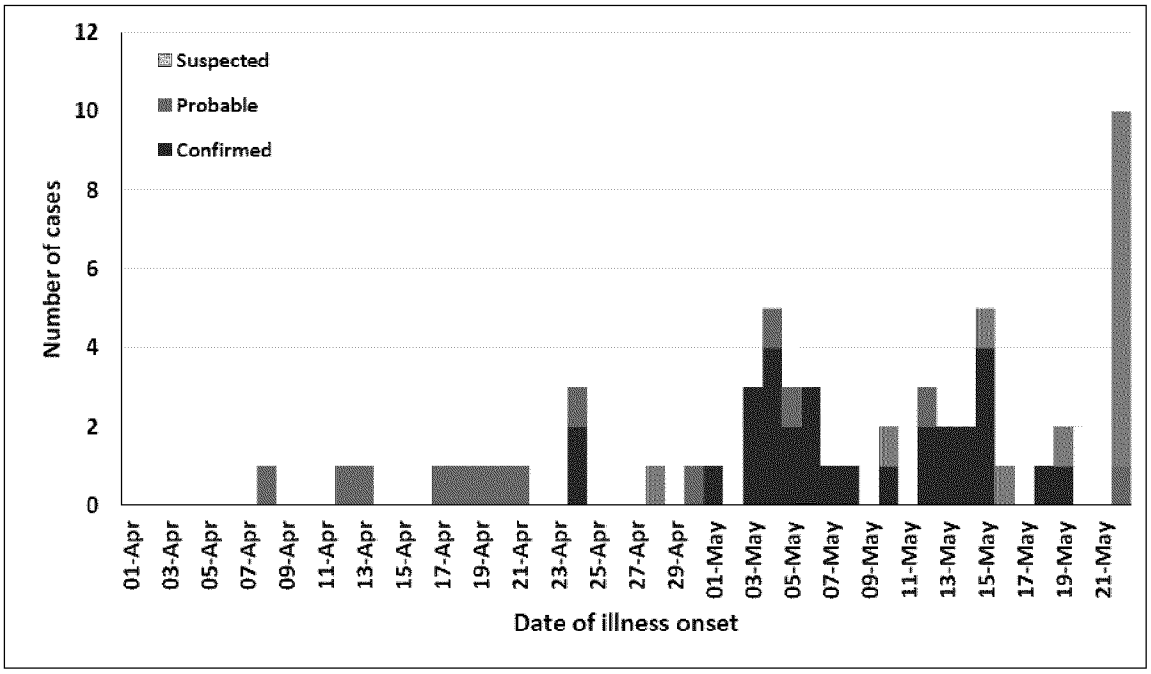
Health Zones (HZ)	Cases				Deaths	Contacts		
	Confirmed	Probable	Suspected	Total	Total	# Followed	Total	% Followed
Bikoro	10	11	1	22	16	265 (-213)	377 (-198)	70 (-13)
Iboko	21	2	4 (-1)	27 (-1)	6	317 (+21)	430 (+94)	74 (-14)
Wangata	4	0	1 (+1) (-1)	5	3	154 (+6)	185 (+0)	83 (+3)
Ntondo	0	0	0 (-1)	0 (-1)	0	0	0	-- --
Total	**35**	**13**	**6** (+1) (-3)	**54** (-2)	**25**	**736** (-186)	**992** (-104)	**74** (-10)

Provisional Case Counts – DRC MOHP Press Release dated 28 May 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours from date of data with exception of contact information (compared over 48 hours).

Overall:

- One (1) new suspected case was reported in Wangata; this person was a known contact.
- The suspected case in Ntondo HZ has tested negative.
- As of 28 May, there were a total of 54 cases (35 confirmed cases, 13 probable, 6 suspected), distributed in the following HZs: Bikoro (22 cases), Iboko (27 cases), and Wangata (5 cases).
- The total number of deaths among the total cases remained 25.
- Over the past two days, the total number of contacts identified has dropped from 1096 to 916, and increased again to 992. The percentage of the total number of identified contacts being followed has decreased from 84% two days ago to 74%.
- An epi curve was published in the latest [HYPERLINK "http://apps.who.int/iris/bitstream/handle/10665/272662/SITREP-EVD-DRC-20180525-eng.pdf?utm_source=Newsweaver&utm_medium=email&utm_term=click+here+to+download+the+complete+situation+report&utm_content=Tag%3AAFRO%2FWHE%2FHIM+Outbreaks+Weekly&utm_campaign=WHO+AFRO+-+Situation+Report+-+Ebola+Virus+Disease+Outbreak+in+DRC+-+Sitrep+05+%282018%29"].

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO



Bikoro HZ:

- No updates

Iboko HZ:

- One (1) suspected case tested negative.

Wangata HZ (in city of Mbandaka):

- One (1) suspected case tested negative.
- One (1) new suspected case was reported.

Ntondo:

- One (1) suspected case tested negative.

Laboratory

- All Ebola testing (including confirmatory testing) is being carried out by the MOHP via the mobile labs.
- A team from the INRB has been deployed to perform animal sampling with a focus on bats in the affected areas.
- USAID's partner, PREDICT 2 is supporting INRB by performing genetic analysis on a subset of samples that tested positive by PCR or RDT. As of May 17, they had provided approximately $15,000 in supplies, fuel and lab support.

Case Management

- The number of patients in treatment facilities and their distribution is as follows:

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Treatment Facility	# Patients
Mbandaka ETU	0 (-1)
Bikoro ETU	10 (-4)
Iboko transit center	2 (-1)
Itipo transit center	4 (+1)
Moheli transit center	1
Total	**17 (-5)**

- MSF is establishing a new ETU in Iboko.
- MSF ETU outside of Mbandaka has progressed rapidly; if needed, the unit could be used immediately.

Vaccine/Research

Ring Vaccination:

- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus–Zaire Ebola virus (rVSV-ZEBOV) vaccine on Monday, 21 May in Mbandaka.
- In total, 364 people have been vaccinated in Mbandaka as of 28 May.
- Vaccinations in Bikoro and Itipo started 28 May.
- Vaccinations in Iboko are scheduled to begin on Wednesday, 31 May.
- Protocol changes regarding vaccinating children under six years of age and pregnant women are being reviewed by the DRC's ethics committee.
- The types of people targeted with the vaccine have been broadened to include traditional chiefs, religious and community leaders, civil society, and representatives of native populations.
- The number of persons vaccinated since the start of ring vaccination on 21 May in Mbandaka is as follows:

Date	All	HCW	Contacts	Leaders
21-May	**33**	10	22	1
22-May	**0**	0	0	0
23-May	**40**	20	20	0
24-May	**81**	-	-	-
25-May	**56**	-	-	-
26-May	104	-	-	-
27-May	**50**	-	-	-
Total	**364**	30	42	1

Communication & Social Mobilization

- Psychosocial caregivers continue to provide support to families of victims, case contacts, patients in ETUs, and those who have been discharged from ETUs. Commission members trained psychosocial care providers who will be working in the affected areas.
- The commission continues to hold awareness raising events in public spaces and entry points in Mbandaka.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- The call center is now taking calls on Ebola and being managed by the MoHP.
- The commission organized the training of community relays to do awareness raising in their communities.
- The commission is working with an association of Pygmies to inform the design of communications interventions.
- Last week, the Health Minister chaired a meeting with the local Mbandaka committee against Ebola Virus Disease and met one of the three former confirmed patients, who has since recovered.

Response & Coordination

- While in Mbandaka on 25 May, CDC staff attended a surveillance meeting where there was a heavy focus on contact tracing. The Minister called for one "epidemiologist sheriff" to be installed in each of the primary outbreak sites who will be responsible for ensuring the teams working below her/him are accountable.
- CDC Sr. Technical Advisor on GOARN team was in Bikoro 28 May with the Minister of Health, working with MOHP and WHO to improve surveillance, contact tracing, and overall response.
- As of the end of the day on May 25th all of the $8 million funding committed by USAID has been obligated to WHO, UNICEF, and IFRC.
- The priorities for the use of the $8 million in USAID funding for the response efforts includes surveillance, contact tracing, community mobilization, safe and dignified burials, point of entry screening, operational support including the air bridge, communication, as well as other critical activities identified on the ground in Équateur province.

WASH

- The commission continues to provide safe burials and services to disinfect homes, health facilities, and other structures.
- WASH related supplies such as Aquatabs, soap, and liquid chlorine.

Border Health

- **Countries Reported to Have Implemented Entry Screening (20)**

Angola	Gabon	Nigeria	Uganda
Botswana	Gambia	Rwanda	Zambia
Cameroon	Ghana	Seychelles	
Central African Republic	Kenya	South Sudan	
China	Malawi	Tanzania	
Ethiopia	Mozambique	Thailand	

- Screening at the main entry points of travelers from Mbandaka to other provinces and Bikoro continue; 4,588 people were screened 27 May. New entry points in Bikoro have been recently identified as entry points are being continuously sought and assessed.
- On 25 May, a summary of surveillance at points of entry to Mbandaka and Kinshasa showed overall low coverage due to the slow deployment of teams; MoHP officials engaged with the Ministry of Transport to increase health screening at the Mbandaka port.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- During travel from Mbandaka to Kinshasa, CDC staff observed the screening of passengers and certain corrective actions were taken to improve overall performance. This included refresher training for staff taking temperatures, addressing a gap of screening of those using the VIP entrance and general inspection of procedures and protocols.
- A system for managing alerts at entry points is now being implemented in the affected areas.
- Sixty-six teams (with a total of 132 members) were preparing to deploy to ports on the Congo River in Kinshasa as of 26 May, to screen incoming passengers.

Deployment & Logistics

- As of 29 May, seven CDC staff are deployed to DRC, two to provide support to CDC-DRC country office and five under the GOARN auspices (Technical Advisor, EOC and 3 Border Health).
- Additional CDC deployments include 4 persons to support CDC-DRC (departures between 30 May – 10 June), and two persons as part of GOARN response: 1 person for EOC support (2 June), 1 person for border health (5 June).
- USAID is rotating surge staff support to the field. The first person was scheduled to return on Sunday 27 May, and two more persons will depart week of 27 May: One [1] Infectious Disease Advisor and one [1] senior WASH advisor. A TDY plan has been developed. Surge staff will likely be supporting the USAID health team at the mission through August.
- WHO provided feedback that lodging for response personnel is limited. In Mbandaka, all 80 beds are occupied and all six (6) beds in local monasteries are occupied. UN logistics is searching for additional beds for response personnel, however, it is challenging and deployment coordinators are encouraged to work closely with WHO and partners.
- As of 24 May, GOARN informed members that current travel approvals are on hold while the WHO Country Office works to prioritize deployments due to the issue of limited resources in Kinshasa and the field.

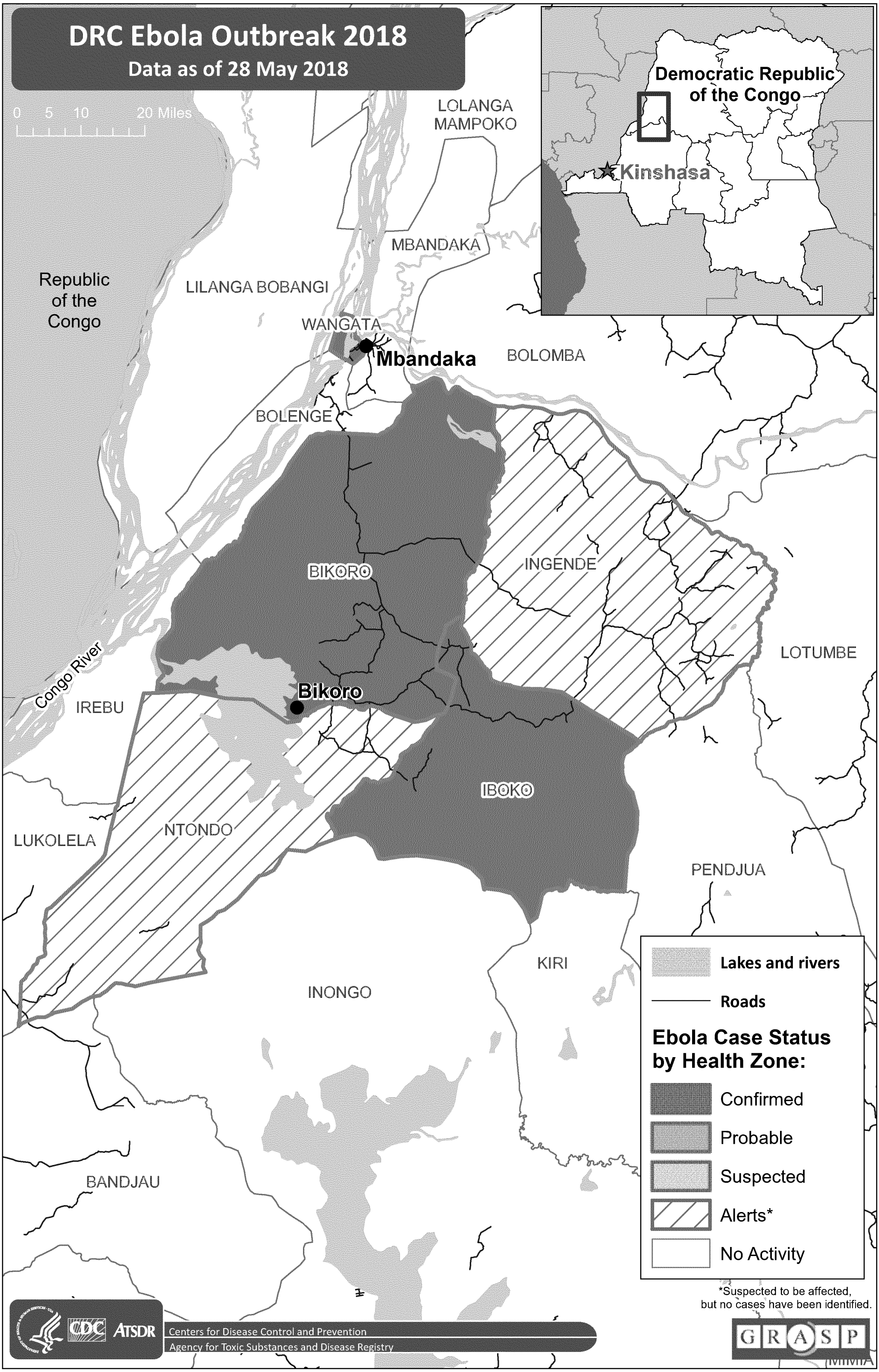
Challenges

- Resources for response personnel in the field is limited; efforts to mobilize additional resources are underway.
- The number of local doctors and nurses available to support the provision of health care is another limitation that affects the ability to rapidly scale up ETUs and provide safe clinical management that meets standards of care; preparation is needed to be able to deliver therapeutics.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 28 May 2018



From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 5/22/2018 1:17:03 PM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; (b)(6)@nsc.eop.gov; Berger, Sherri (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2b1ac8b1b9ba4abe8ef7b1d7abcd8d71-HHS-sob8-cd]; beth.d.kennedy.ctr@mail.mil; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; Daniel, Katherine L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c1f217e1320f41839e073f4a00529a52-HHS-kdl8-cd]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; McGowan, Robert K (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e6175b088b1d49a4bfa2de3862800d4a-HHS-omc2-cd]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; Schuchat, Anne (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=848b7544f27d4a2a9554a80e78d002fc-HHS-acs1-cd]; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov; Wolfe, Mitchell (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6a21848015074b41965a8925c65edf21-HHS-msw6-cd]
CC: Luciana.L.Borio@nsc.eop.gov; GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC Ebola USG sitrep - 22 May 2018
Attachments: DRC Ebola USG sitrep 13_21 May 2018.docx

Dear Colleagues,

Today's USG sitrep on the DRC Ebola situation is attached.

Just a reminder that sitreps will be distributed twice weekly on a Tues. and Fri. schedule. GDD Ops would appreciate receiving reports about your organization's contribution to the response by 3 PM on Mon. and Thurs.

Thank you.
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
Emergency Response and Recovery Branch

Division of Global Health Protection
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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

22-MAY-2018

SITREP #13

INTERNAL USG USE ONLY

[redacted]	28 (+6)	21	2 (-4)	27 (+1)	561/628 (89%)
[redacted]	Confirmed Cases	Probable Cases	Suspected Cases	Deaths	Contacts Followed/Total (%)

Provisional Case Counts - Data as of 21 May 2018 in DRC.
Changes (+/-) reflects changes over past 24 hours.

Situation Overview

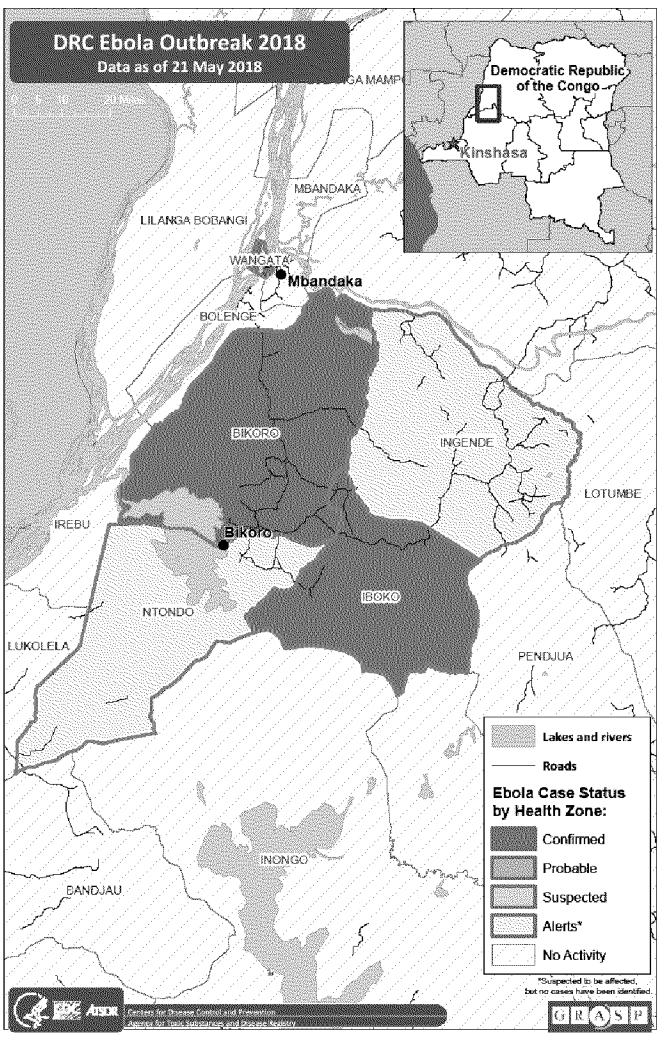
On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province, in Northwest DRC.

The three health zones reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka).

With an increased number of cases identified in Iboko, the MoHP and partners are deploying additional resources to the area, including helicopter service, a team to investigate chains of transmission, and a long-term response team.

In Wangata, one confirmed case fled the Ebola Treatment Center (ETC) on 19 May; contact tracers are working to determine her whereabouts. Two additional patients fled the ETC in the evening of 21 May and have been found. Contacts are being traced and the number is anticipated to increase. National Coordination Committee (CNC) led by the Minister of Public Health, has noted the need for additional epidemiologists and data managers in Wangata (Mbandaka).

On Monday, May 21, 2018, the Minister of Health, Dr. Oly Ilunga Kalenga, launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak.



Double click to enlarge map

Sources: CDC, DRC MoHP, GOARN, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

Health Zones (HZ)	Confirmed Cases	Probable Cases	Suspected Cases	Total Cases	Deaths	Contacts Followed	Contacts Total	% Contacts Followed
Bikoro	10	19	0	29	22	301 (+28)	361	83 (+7)
Iboko	14 (+6)	2	0 (-6)	16	3	115 (+20)	120	96 (+17)
Wangata*	4	0	2 (+2)	6 (+2)	2 (+1)	115 (+2)	117	98 (+1)
Ntondo	0	0	--	0	0	30	30	100
Total	**28 (+6)**	**21**	**2 (-4)**	**51 (+2)**	**27 (+1)**	**561 (+50)**	**628**	**89 (+8)**

* In the city of Mbandaka

Overall:

- As of 21 May, an additional two cases in Wangata brings the total number of cases to 51 (28 confirmed cases, 2 suspected, 21 probable), distributed in the following HZs: Bikoro (29 cases), Iboko (16 cases), and Wangata (6 cases).
- The total number of cases includes 27 deaths.
- Compared with the previous 24 hours, an additional 50 contacts were seen yesterday (561), while the total number of identified contacts (628) remained the same. This raised the percentage of the total number of identified contacts being followed to 89%.

Bikoro HZ:

- No updates

Iboko HZ:

- Six previous suspected cases have now been confirmed in Iboko HZ.

Wangata HZ (in city of Mbandaka):

- Two new suspected cases reported; one new death was recorded.
- The whereabouts of the confirmed case who fled ETC on 19 May continues to be investigated.

Laboratory

- WHO is providing DRC with OraSure rapid diagnostic tests (RDTs) from BARDA for use in the field. Teams in country will attempt to collect data which can be used to support the analysis for 510(k) Premarket Notification.

Case Management

- Sixteen (16) people are receiving treatment in Ebola Treatment Centers/Units: Bikoro (5), Mbandaka (2), Iboko (1), Itipo [in Iboko HZ] (8).

Vaccine/Research

- The MoHP launched the use of ring vaccination with recombinant vesicular stomatitis virus–Zaire Ebola virus (rVSV-ZEBOV) today, 21 May in Mbandaka.
- The MoHP is expected to provide an in-depth update about the first day of the campaign tomorrow 22 May.

Sources: CDC, DRC MoHP, GOARN, NBIC, UNICEF, USAID, US Department of State, WHO

- On Saturday 19 May 2018, the Ethics Committee of the School of Public Health of the University of Kinshasa validated the vaccination protocol sent for examination by the MoHP and WHO.
- NIAID -WHO technical assistance: Under the auspices of the recently signed WHO-NIAID/NIH Memorandum of Understanding, NIAID/NIH is providing technical assistance to the DRC-WHO effort to plan and implement a research response to the outbreak. NIAID staff has been providing technical assistance on multiple aspects of the outbreak, including efforts to undertake vaccine, therapeutics, and diagnostic research.
    - For vaccine research, NIAID has provided WHO with Social Mobilization, Communication, and Community Engagement materials from the Partnership for Research on Ebola Virus in Liberia (PREVAIL) 1 Cluster Response vaccination protocol conducted in Liberia, along with partial two-year immunogenicity data for Merck's rVSV-ZEBOV candidate from the randomized, controlled Phase 2 portion of PREVAIL 1.
    - For therapeutics, NIAID has provided the protocol and standard operating procedures for ZMapp administration from the randomized, controlled trial known as PREVAIL 2.
- NIAID - Support for the USG Interagency Response:
    - NIH has an open label clinical trial, entitled "Pre-Exposure Prophylaxis in Individuals at Potential Occupational Risk for Ebola Virus Exposure" or "PREPARE," to vaccinate adult volunteers (including deploying healthcare workers and other responders) against Ebola using the Merck rVSV-ZEBOV candidate.
    - Study sites are located at the NIH and Emory University. Staff Deploying from CDC, USAID, and WHO have been informed about this option.
- NIAID - mAb114: NIAID's Vaccine Research Center launched a Phase 1 study of a monoclonal antibody mAb114, active against Zaire Ebolavirus, on 16 May at the NIH Clinical Center.
    - The trial will enroll 18 people ages 18-60.
    - mAb114 was isolated from a survivor of the 1995 Ebola outbreak in Kikwit, Democratic Republic of Congo (DRC) through a research partnership between NIH and investigators at the DRC's Institut National de Recherche Biomédicale (INRB).
    - The single monoclonal antibody protected rhesus macaques when given as late as 5 days after Ebola infection (Misasi et al, Science, 2016).
- A Government of Guinea team has deployed to DRC to assist with vaccination efforts and will share lessons learned from the ring vaccination trial previously conducted in Guinea.
- Ring vaccination protocol and materials, as well as social mobilization materials, that will be used in DRC will be from past experiences in Guinea, given language and protocols in DRC.
- CDC, FDA and NIAID representatives participated in a WHO consultation on the "monitored emergency use of unregistered and experimental interventions (MEURI)." A statement summarizing recommendations is available online (http://www.who.int/emergencies/ebola/MEURI-Ebola.pdf).

Communication & Social Mobilization

- The MoHP, in collaboration with WHO and partners, have identified areas where rumors or resistance to health interventions necessitate robust communications interventions. They have developed messaging to encourage students to continue attending classes following reports that:
    - Students were scared to attend school.
    - Parents were reportedly removing their students from school due to fears that the children would be vaccinated and that the vaccination is deadly to children
- The CNC continues to highlight opposition to communication messages and efforts to raise awareness in newly affected areas.
- The CNC noted that reinforcement psychologists are needed. There is no psychologist available in Iboko, despite numerous cases. The group recommended that one psychologist be deployed to Iboko and another to Bikoro.

Sources: CDC, DRC MoHP, GOARN, NBIC, UNICEF, USAID, US Department of State, WHO

- Terms of reference are being developed for a call center in DRC that would be set up to answer questions related to Ebola.
- CDC gave a brief update regarding DRC Ebola during a previously scheduled CSTE meeting on 21 May. Outreach during a meeting with ASTHO is planned for 25 May.

Response & Coordination

- The lack of connectivity was identified as a major challenge in Bikoro. PATH is working to address the situation.
- In addition to the $1 million that USAID Global Health Bureau released, for internal consumption only, USAID is moving forward an additional obligation of up to $2 million from the Global Health Bureau.
- The European Commission has announced a package of urgent humanitarian aid to help contain the outbreak of Ebola in DRC. An initial €1.5 million will provide logistics support to the World Health Organization (WHO), and a further €130,000 offered to the International Federation of the Red Cross (IFRC) for life-saving interventions by the Congolese Red Cross. Moreover, the Commission's humanitarian air service ECHO Flight is due to transport medical experts and emergency staff as well as equipment to the affected areas.
- The EU also stands ready to deploy the European Medical Corps, a voluntary pool of European specialist teams and medical assets if requested.
- Today, 22 May, the United States announced that the U.S. Agency for International Development (USAID) is contributing up to $7 million at this stage to combat the Ebola outbreak in the Democratic Republic of Congo (DRC) at this stage. This additional funding, combined with the $1 million USAID committed last week, will provide a total of up to $8 million to help prevent the spread of this deadly disease. Secretary of Health and Human Services Alex Azar made the announcement in his address before the 71st World Health Assembly in Geneva, Switzerland.
- Two (2) US-funded Africa CDC epidemiologists and one Africa CDC employee are presently in DRC. On 23 May, 25 reserve corps staff from AU Member States will arrive.

WASH

- No new updates

Border Health

- **Countries Reported to Have Implemented Entry Screening (20)**

Angola	Ethiopia	Malawi	South Sudan
Botswana	Gabon	Nigeria	Tanzania
Cameroon	Gambia	Rwanda	Thailand
Central African Republic	Ghana	Seychelles	Uganda
China	Kenya	South Africa	Zambia

- CDC is revising the Travel Notice content to reflect all areas with confirmed cases and the recent WHO IHR Emergency Committee deliberations; clearance and posting of revised notice anticipated 22 May.
- Travel Notice will remain a Level 1 notice.
- CDC Quarantine station staff have delivered CBP pre-shift briefings at 16/20 US POEs. Informational materials have been provided to CBP HQ for distribution to all US POEs.
- CDC is developing electronic airport monitor messaging for inbound travelers; beginning date of display anticipated on 23 May.
- CDC obtained corrected boundaries for the affected health zones of Equateur Province.

Sources: CDC, DRC MoHP, GOARN, NBIC, UNICEF, USAID, US Department of State, WHO

- Entry point reports from the two airports in Kinshasa (N'dolo and N'djili) and the Beach in Kinshasa (the sites in the ports of Mbandaka and Bikoro and the Airport in Mbandaka did not transmit data in time to be included in today's report) indicated that the screening of an additional 214 persons in the past day yielded no suspected EVD cases.
- In neighboring country of Republic of Congo, as of 18 May, no suspected or confirmed cases of EVD have been reported; village markets along the Congo River have been closed at Makomtipoko, Loukolela, Mossaka, Mpouya and Liranga as a preventive measure.

Deployment & Logistics

- USAID has one additional staff member on the ground and are preparing two additional deployments of outbreak response and WASH experts.
- CDC has submitted 15 offers for candidates to deploy under GOARN response. To date, deployment via GOARN has been completed or in process for one (1) SME for Technical Advisor, four (4) staff for border health activities and screening, and two (2) staff for emergency management. CDC anticipates sending additional epidemiologists under GOARN to provide technical assistance in the near future.
- Aside from GOARN, CDC will also deploy a vaccine specialist and a Public Health Advisor to Kinshasa to join two other deployed staff members to augment the operations of the CDC-DRC Country Office during Ebola response.
- USAID has authorized WHO to ship immediately from USAID stockpiles in Dubai, enough additional personal protective equipment kits (PPE) to cover the needs of 55 health posts and 5 hospitals in the outbreak area for the next 30 days.

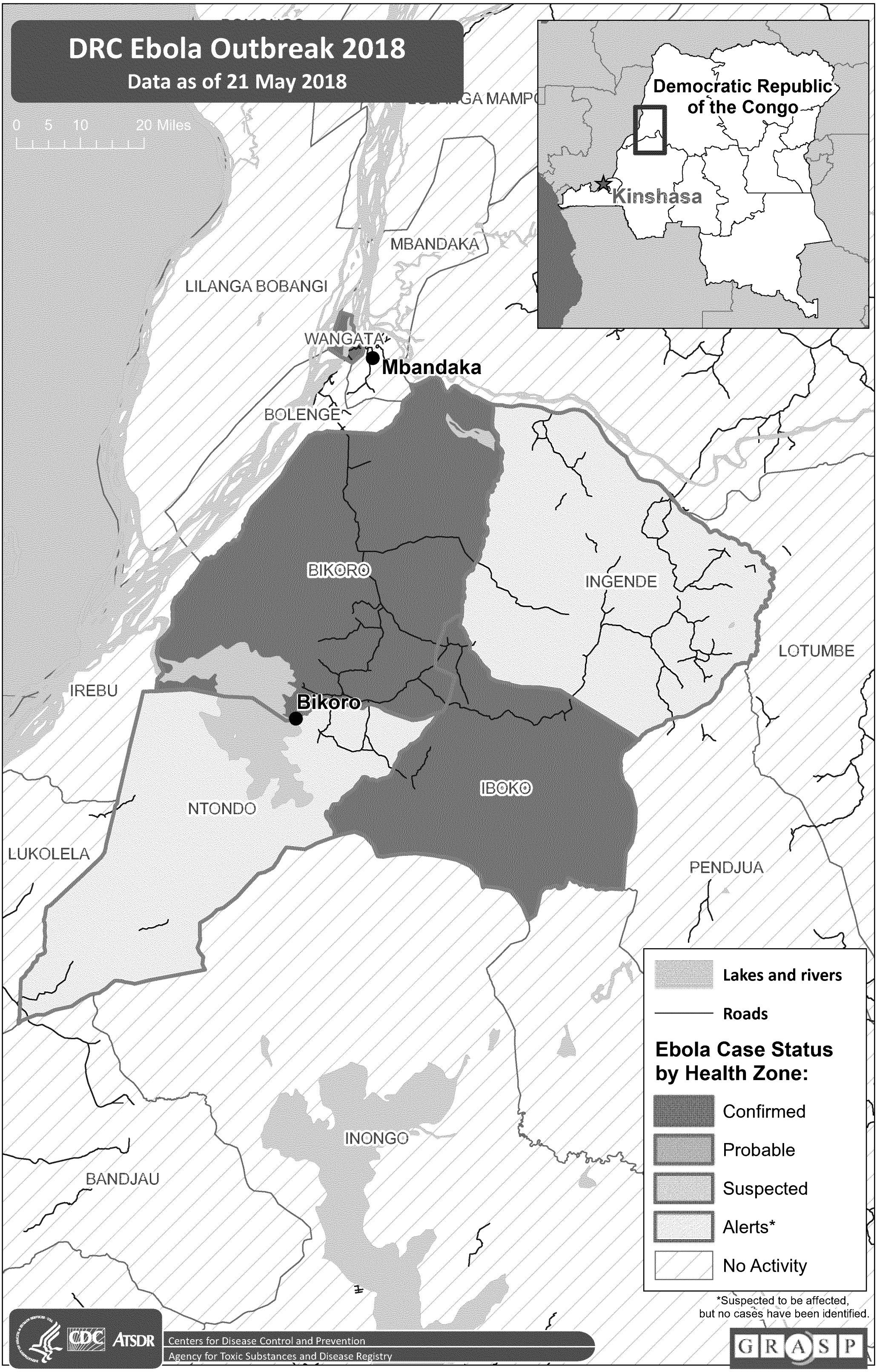
Challenges

- Bikoro borders a lake with fishing-related trade between villages and that drains into the Congo River thus connecting the affected area both upstream to larger communities, as well as downstream to the DRC capital of Kinshasa and Republic of Congo capital of Brazzaville, which could result in new outbreak foci via an infected traveler.
- Coordination of response efforts by MoHP and WHO, in the context of a rapidly developing outbreak and numerous partners offering assistance and/or organizing deployments to DRC.
- Community resistance to care has been reported. UNICEF is working with DRC to address the situation.

Sources: CDC, DRC MoHP, GOARN, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 21 May 2018



From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 6/12/2018 4:01:38 PM
To: outbreak [outbreak@usaid.gov]; aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Brownsteindp@state.gov; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; roderick.davis3.mil@mail.mil; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
CC: Murrill, Christopher S (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=4875fc8d696c4647b3bfdfa78858174d-HHS-csm5-cd]; Henao, Olga L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ff5c6a49630e478c8f75c2a22cb73eb7-HHS-dot8-cd]; GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC EVD - USG SitRep 33_12 June 2018
Attachments: DRC Ebola USG sitrep 33_12 June 2018.docx

Dear Colleagues,

DRC EVD Sitrep 33 is attached. As always, thanks to those who contributed content.

Best,
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
Emergency Response and Recovery Branch

Division of Global Health Protection
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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

12 JUNE 2018

SITREP #33

INTERNAL USG USE ONLY

55	38	14	3	28	633 / 634 (100 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

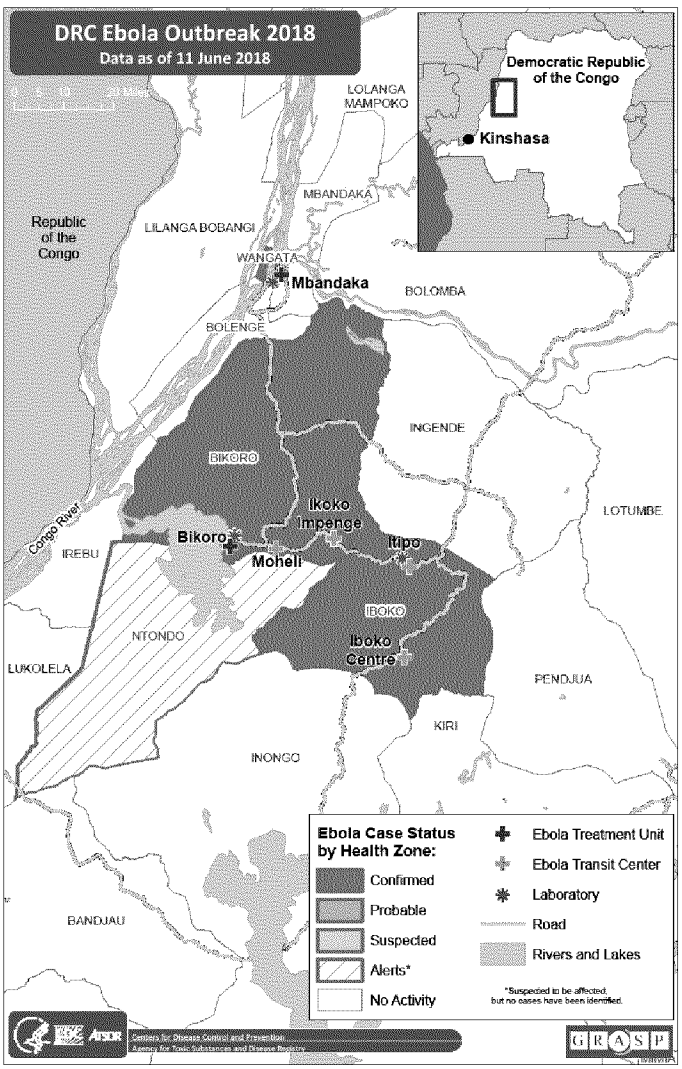
Provisional Case Counts - DRC MoHP Press Release dated 11 June 2018. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province in Northwest DRC.

The three health zones (HZ) reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). No confirmed cases have been reported in the past 21 days in Bikoro or Wangata. Efforts are now focused on Itipo in Iboko HZ, where one new confirmed case with symptom onset on 2 June and one probable case in a Batwa who died on 3 June, were recently reported. Surveillance for cases, contact tracing and investigations continue.

On 21 May 2018, the MoHP launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak.



Double click to enlarge map

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

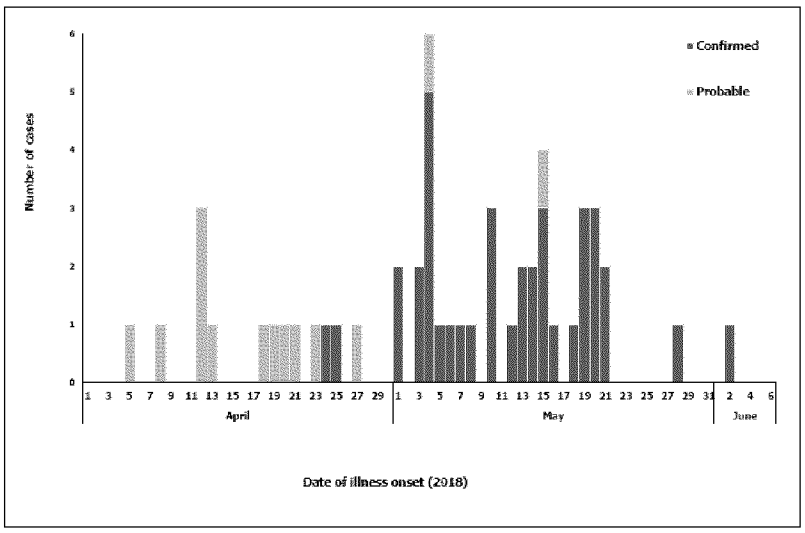
Health Zones (HZ)	Cases						Deaths	Contacts				
	Confirmed	Probable	Suspected			Total		Total	# Followed		Total	% Followed
Bikoro	10	11	1			22		18	2	(-8)	2 (-8)	100
Iboko	24	3	2	(+2)	(-12)	29	(-10)	7	538	(+91)	538 (-7)	100 (+18)
Wangata	4	0	0		(-1)	4	(-1)	3	93	(+17)	94 (+17)	99
Ntondo	0	0	0			0		0	0		0	0
Total	**38**	**14**	**3**	(+2)	(-13)	**55**	(-11)	**28**	**633**	(+100)	**634** (+2)	**100** (+16)

Provisional Case Counts – DRC MoHP Press Release dated 11 June 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours.

Overall:

- As of 11 June, the total number of cases has decreased to 55 (38 confirmed cases, 14 probable, 3 suspected), distributed in the following HZs: Bikoro (22 cases), Iboko (29 cases), and Wangata (4 cases). The total number of deaths among the total cases is unchanged at 28.
    - Two (2) new suspected cases were reported, both among known contacts.
    - Thirteen (13) suspected cases tested negative for EVD.
    - The percentage of the total number of identified contacts being followed increased from 84% to 100%.
- An epi curve was published in the latest [HYPERLINK "http://apps.who.int/iris/bitstream/handle/10665/272785/SITREP_EVD_DRC_20180608-eng.pdf?utm_source=Newsweaver&utm_medium=email&utm_term=click+here+to+download+the+complete+situation+report&utm_content=Tag%3AAFRO%2FWHE%2FHIM+Outbreaks+Weekly&utm_campaign=WHO+AFRO+-+Situation+Report+-+Ebola+Virus+Disease+Outbreak+in+DRC+-+Sitrep+09+%282018%29"]:

Figure 1: Epidemic curve for Ebola virus disease outbreak in Equateur Province, Democratic Republic of the Congo, 6 June 2018 (n=52)



Bikoro HZ:

- No updates

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Iboko HZ:

- Two (2) new suspected cases were reported, one (1) in Itipo and one (1) in Bokongo.
- Twelve (12) suspected cases tested negative for EVD.
- The family contacts and contacts of contacts associated with the last confirmed case have been identified; a dialogue was initiated with the family that was receptive and agreed to collaborate with the health authorities. Vaccination within these concentric circles are underway.

Wangata HZ (in city of Mbandaka):

- One (1) suspected case tested negative for EVD.

Laboratory

- No new updates

Case Management

- The number of patients in treatment facilities and their distribution is as follows:

Treatment Facility	# Patients	
Mbandaka ETU	0	
Bikoro ETU	6*	
Iboko transit center	0	
Itipo transit center	9**	
Moheli transit center	0	
Ikoko Impenge transit center	1	(-1)
Total	**16**	**(-1)**

Changes (+/-) reflects net changes over past 24 hours.
* The pregnant woman who was previously discharged as a recovered case was readmitted due to intrauterine death – she delivered the fetus and remains stable. The amniotic fluid and blood were tested and were positive for Ebola virus.
** The PEC (Prise en Charge – Case Management)/Surveillance Committees) have decided to remove the suspects who have at least one negative PCR and are awaiting the second negative from the list of suspects – thus, the 8 suspects awaiting 2nd PCR in Itipo and the 4 in Bikoro are not counted in the suspect total in the case count table.

- The overall number of patients currently in Ebola Treatment Unit (ETU)/isolation wards, has dropped by one (1) to 16. Among the 16 patients, only one (1) is a confirmed case in the Itipo transit center.
- On 8 June, there was a meeting in Bikoro to discuss case management protocols.
- There was a discussion at the National Coordination Committee (CNC) about the capacity of the transit center at Itipo to manage patients – MSF confirmed that there is currently 100% capacity to manage patients there (although previously it had been merely an isolation area).
- The International Rescue Committee (IRC) has been requested to support 15 health facilities – seven in Bolenge (on critical river routes to Kinshasa) and eight in Itipo/Iboko. The IRC will commence in Bolenge immediately, and will scale-up in Itipo/Iboko once the UN has created the access and logistics needed. IRC's emergency response team of medical/IPC/WASH/ logistics personnel are assessing precise needs in all seven Bolenge health facilities over 7-8 June 2018.

Vaccine/Research

Ring Vaccination:

- According to MoHP, as of 11 June, a cumulative total of 2,295 people were vaccinated, including 713 in Mbandaka, 498 in Bikoro, 1,054 in Iboko and 30 in Ingende.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- Across locations, 74 people were vaccinated on June 10, all in Iboko/Itipo (27 front-line workers, 45 contacts, and 2 contacts of contacts). No vaccinations have been given in Mbandaka and Bikoro for past two days; reportedly all eligible persons in these two HZs have been reached for now.
- Follow up information on vaccines:
    - As of 11 June, Team 1 has shared information regarding the follow up of 962 persons vaccinated in Bikoro and Itipo. Information included numbers of persons with fever and headache as well as complete three-day follow up information for 359 vaccine recipients who were seen.
    - Information was provided regarding the vaccination of contacts and secondary contacts of the child who was the last confirmed case (died on 8 June); vaccine recipients have included 4 health care workers, 27 contacts and 42 contacts of contacts.
    - As of 10 June, Team 2 has vaccinated 1,145 persons including 347 FLWs – no info has been given on follow-up of vaccinated persons.
- The vaccination teams are composed of Guineans paired with Congolese. WHO estimates that 80 percent of their international staff is Guinean.
- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus – Zaire Ebola virus (rVSV-ZEBOV) vaccine in Mbandaka on 21 May.

Communications & Social Mobilization

- The issue of how to support school fees and the overall livelihood of orphans is being raised, but a plan is not yet in place.
- Outreach describing EVD was done with taxi men and passengers in the Bolenge neighborhood of Mbandaka
- USAID medical and WASH advisors are in Mbandaka from 8-13 June.
- On 9 June, USAID Technical advisors participated in a UNICEF–led focus group discussion with women from Wangata Health Zone and community health workers. With USAID funding, UNICEF is providing critical community engagement activities.
    - Participants described their knowledge of Ebola and how many in their community still don't believe Ebola exists. When asked how they heard of Ebola they listed the following: door-to-door activities, church, radio (RFI and Okapi), school, sensitization activities.
    - Rumors of EVD being caused by witchcraft continue to persist. For example a common rumor is that a curse was placed because someone stole animals that a hunter had caught in a trap in Ikoko-Impenge.
    - Several women said they changed their mind on Ebola because they started seeing and hearing about deaths, and started seeing foreigners come in large vehicles.
- Issues with resistance were encountered and addressed in Iboko (Bokongo and Mooto).
- On 9 June, the Minister of Health held a press conference to present the results of the first month of the government response to the ninth epidemic of Ebola in the DRC. Achievements of the Government of DRC that were noted included:
    - Distribution of 65 tons of drugs
    - 50 motorcycles and 50 bicycles
    - 150 deployed experts
    - 72 POEs covered
    - >30,000 travelers screened
    - Free care in 7 HZs covering 7 general reference hospitals
    - 103 health centers

Response & Coordination

- June 11, 2018, the Minister of Health, Dr. Oly Ilunga Kalenga, went to Itipo, in the health zone of Iboko, accompanied by the Director General of WHO, Dr. Tedros Adhanom.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

  - The Minister of Health congratulated MoHP experts on quickly putting in place response components despite difficult logistical considerations, including the local commissions and the mechanism for monitoring alerts and contacts through rapid response teams that go from village to village on a motorcycle.
  - The Minister of Health also noted the success in establishing dialog with the Batwa indigenous communities, enabling their acceptance of public health measures including safe burial.
  - ALIMA was thanked for installing an ETC in Itipo in 10 days, enabling patients in Itipo to be treated near their homes rather than requiring transport to Bikoro Reference General Hospital.
  - The Minister of Health and WHO DG ended visit by meeting with the National Association of Ebola Winners (ANVE).
- CDC's Ebola Response Lead accompanied the WHO Deputy Director-General (DDG) and the WHO AFRO Regional Emergency Director (RED) on a field mission to the Democratic Republic of the Congo from 5-9 June 2018 to conduct on-the-spot assessment and support the response operations. The DDG and RED held meetings with the Minister of Health, partners including UNICEF, and the Incident Management team. The DDG and RED, accompanied by the Minister of Health, also visited the affected health zones, including Mbandaka, Iboko and the hot-spot Itipo.
- CDC's Ebola Technical Expert is working in collaboration with MoHP and WHO in Bikoro and Itipo on improvements of surveillance processes and to review hospital and epidemiologic data to examine chains of transmission. He is also advocating for including churches to improve community cooperation.
- CDC's Vaccine Specialist is working in Iboko Centre to observe ring vaccination processes with MoHP, WHO, MSF colleagues.
- Funding towards the Strategic Response has been provided to WHO from Italy (€ 300 000), CERF (US$ 800 000), GAVI (US$ 1 million), USAID (US$ 5.3 million), Wellcome Trust & UK DFID (US$ 4.1 million), UK-DFID (£5 million), Germany (€5 million), Norway (US$ 8 million NOK), Canada ($ 1 million CAD), World Bank PEF (US$ 6.8 million) bringing the total to around US$ 32.6 million.
- During USAID field visit to Mbandaka, USAID technical advisors met with WHO to discuss the Ebola response plan. WHO plans on scaling up response efforts in remote parts of Iboko and will send multidisciplinary teams to get a better understanding of the chains of transmission. These teams will be composed of clinicians, epidemiologists, logisticians, and social mobilizers.
- USAID will participate in a day trip to Itipo on 12 June with DFID, ECHO, and the World Bank, which will be led by the OCHA Humanitarian Coordinator. OCHA is in the process of developing a 4Ws (Who does What, Where and When) and a monitoring framework for the response, which will identify critical gaps in the response.
- Beyond the management of the current epidemic, the Government's priority is to improve the country's epidemiological surveillance system and the resilience of its health system. Since the Ebola virus has a natural reservoir located in the equatorial forest, the country must expect to face a tenth epidemic and prepare for it. Thus, all the activities supported by the Government in the context of this epidemic follow this logic. This includes the establishment of an EOC in Mbandaka and the expansion and strengthening of the Kinshasa EOC.
- In addition, free healthcare, which is now effective in seven health zones, is part of the Government's vision to achieve universal health coverage in the DRC. According to the Minister of Health, if the DRC manages to make universal health coverage a reality for millions of Congolese in a context as difficult as that of an Ebola epidemic, it means that the country has the means to extend it all over the country.
- Free healthcare in Ebola affected health zones has created a rise in service utilization, resulting in drug stock outs. The Director of the General Hospital (HGR) of Mbandaka estimates that service utilization has increased four-fold. UNICEF is providing several health facilities with drugs, while the World Bank is supporting salaries of health care workers.
- A guideline on food support linked to psychosocial care to households affected by EVD was finalized jointly by UNICEF and partners.
- On 5 June 2018, WFP, UNICEF and the MoHP, started a joint distribution of food and NFI to people discharged from Ebola treatment units in Mbandaka. Discharged patients have received 250 g of super cereals and 25 g of oil over 15 days and have also received a three month family ration.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

WASH

- WHO and partners developed a new IPC protocol that will be used by all partners conducting IPC activities. Additionally they have developed a geographic division whereby >40 health facilities will be divided among the partners to ensure adequate coverage without duplication of effort.
- USAID had a joint meeting with UNICEF, WHO IRC, IMC and IFRC to discuss the minimum package of services for IPC, Triage and WASH at health facilities considered high risk in affected and surrounding health zones. This minimum package of services will be standardized and adopted by all IPC and WASH partners.
- CDC continues to provide technical assistance and advice through daily CNC meetings. In addition, CDC meets daily with the Minister of Health.

Border Health (BH)

- **Countries Reported to Have Implemented Entry Screening (23)**

Angola	Gabon	Mozambique	Tanzania
Botswana	Gambia	Nigeria	Thailand
Cameroon	Ghana	Republic of Congo (Congo-R)*	Vietnam
Central African Republic	Kenya	Rwanda	Uganda
China	Malawi	Seychelles	Zambia
Ethiopia	Mali	South Sudan	

*Provided through US Embassy cable. Previously not understood to have implemented entry screening. Both entry and exit scanning are reportedly being conducted in Kinshasa and Brazzaville. There are no known passenger flights from Kinshasa to/from Brazzaville.

- In DRC, screening at the main entry points of travelers continue. On 11 June, 3,002 people were screened across the equipped points of entry: 440 in Bikoro, 1,951 in Mbandaka and 611 in Kinshasa.
- One (1) alert was reported in the port of Sacre Coeur (Mbandaka) with the finding of the body of a 40 year-old man from north of Mbandaka. Earlier reports indicated symptoms including: fever, vomiting, diarrhea and bloody nose. Subsequent investigations indicate he was afebrile and had diarrhea. Investigations are ongoing to determine whether or not he was in contact with a known or probable case. The family refused for testing to be done, and an unsafe burial was performed.
- The alert in the north of DRC in village of Endou/Bansangasou in Bas-Uele near CAR border is still being investigated. Initial rapid test was negative, PCR confirmation still pending (sent to INRB via Kisangani); the specimen arrived in Kinshasa on the evening of 10 June, and results are expected on 11 June.
- A 31 year-old AMCIT in Tanzania with reported history of humanitarian healthcare work in DRC from 9-20 April (location reportedly 100 KM east from Bikoro), and illness with onset on/around 25 May was prevented by CBP from boarding a scheduled return flight to the US on 9 June. Subsequently, he was determined by CDC to have no risk of Ebola exposure. CDC decision conveyed to US Embassy in Dar es Salaam.
- The CDC Border Health Team co-facilitated the first day of a two-day train-the-trainers for POE health screening. Participants were FELTP fellows and doctors working for PNHF who will be training POE screeners and will supervise screening activities at the POE.
    - Presentation topics today included an introduction to primary and secondary screening at POE, how to use a thermoflash, IHR in relation to POE, and visual observation at POE for signs/symptoms of Ebola. Visual observation has been emphasized over temperature screening and health declaration forms at POE such as markets and bus stops where the latter two steps are not usually feasible.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- The participants were very engaged, asked good questions related to PPE and thermoflash use, and how to deal with VIPs coming through airports. Participants identified a few omissions on the modified health declaration form (age, sex, and origin of travel), so the Border Health Team will work with IOM to make the requested changes.
- Day 2 of the training will cover setting up primary and secondary screening, hand hygiene, waste management, PPE, and risk communication.

Deployment & Logistics

- As of 11 June, ten CDC staff are deployed to DRC, four to provide support to CDC-DRC country office and six under the GOARN auspices (Technical Advisor, 2 Border Health, Vaccine, EOC, and Epi). The Technical Advisor and Vaccine SME are presently in Iboko HZ and the EOC specialist is in Mbandaka. One of the BH SMEs is scheduled to return 12 June after which the total number of CDC staff deployed will decrease to 9.
- Additional CDC deployments include two persons as part of GOARN response with tentative departures as follows: 1 person for Border Health (12 June), and 1 person for Epi/Surv (16 June).
- WHO has confirmed its request for various types of logistical support from WFP and UNHRD, including IT services (establishment of VHF radio communication network in one location), deployment of staff with various profiles (logistics/camp support, fleet manager, workshop manager, warehouse manager, dispatch officer, admin/HR associate), and security compliance equipment. WFP and UNHRD are acting immediately to respond to the needs.

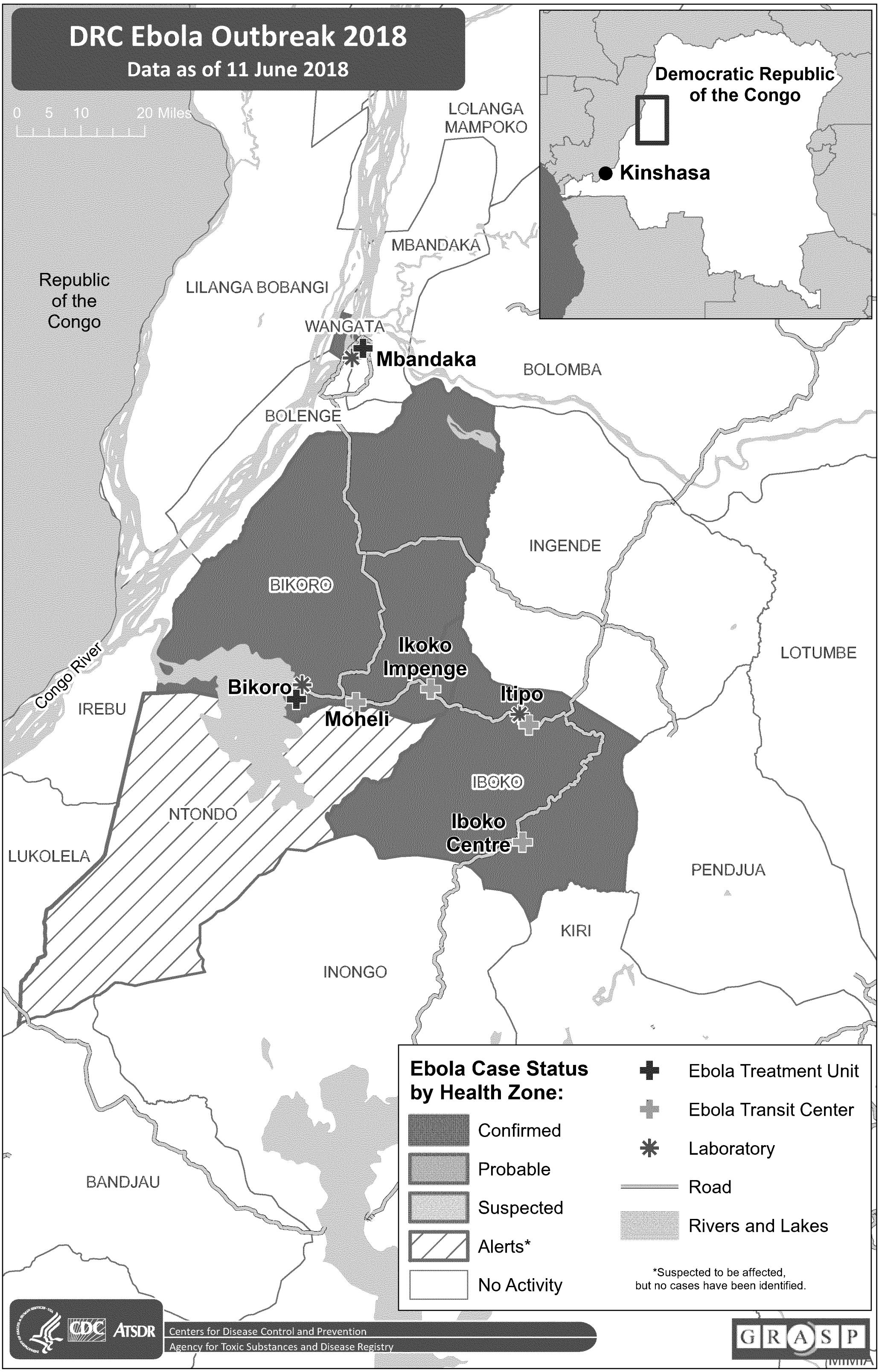
Challenges

- Resources for response personnel in the field is limited; efforts to mobilize additional resources are underway.
- Challenges to contact tracing due to logistical issues, including communication, associated with heavily forested and remote areas continue to be addressed.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 11 June 2018



From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 6/19/2018 1:34:13 PM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Brownsteindp@state.gov; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; roderick.davis3.mil@mail.mil; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
CC: GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC USG Ebola SitRep 38_19 June 2018
Attachments: DRC Ebola USG sitrep 38_19 June 2018.docx

Dear Colleagues,

Today's USG SitRep is attached. The next SitRep will be distributed on 26 June. Please provide input to GDD-Outbreak@cdc.gov by 15:00 on Monday 25 June.

Thank you.
Ray

Ray R. Arthur, PhD
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Emergency Response and Recovery Branch

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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

19 JUNE 2018

SITREP #38

INTERNAL USG USE ONLY

62	38	14	10	28	276 / 289 (96 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

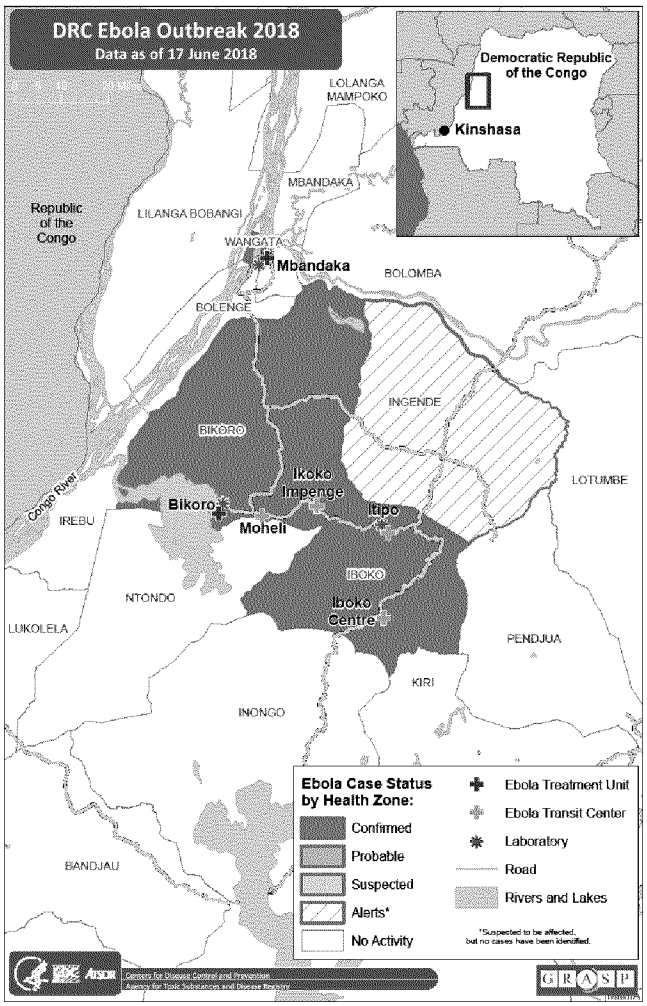
Provisional Case Counts - DRC MoHP Press Release dated 18 June 2018. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province in Northwest DRC.

The three health zones (HZ) reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). No confirmed cases have been reported in the past 21 days in Bikoro or Wangata. Efforts are now focused on Itipo in Iboko HZ, where the most recent confirmed and probable cases were identified. Surveillance for cases, contact tracing and investigations continue.

On 21 May 2018, the MoHP launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak. As of 18 June, a total of 3,017 persons have been vaccinated.



Double click to enlarge map

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

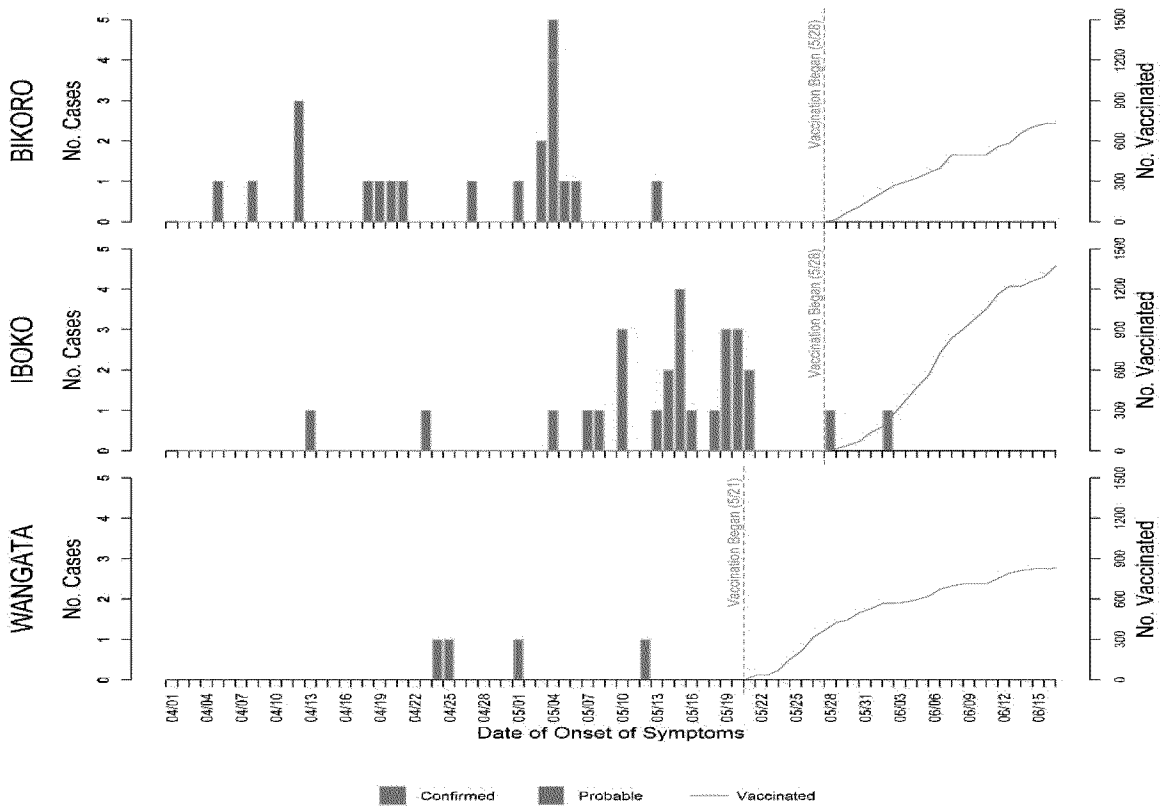
Health Zones (HZ)	Cases				Deaths	Contacts		
	Confirmed	Probable	Suspected	Total	Total	# Followed	Total	% Followed
Bikoro	10	11	4 (-2)	25 (-2)	18	0	0	100
Iboko	24	3	4 (+1) (-1)	31	7	250 (+1)	263	95
Wangata	4	0	0	4	3	26	26	100
Ingende*	0	0	2	2	0	0	0	0
Total	**38**	**14**	**10 (+1) (-3)**	**62 (-2)**	**28**	**276 (+1)**	**289**	**96**

Provisional Case Counts – DRC MoHP Press Release dated 18 June 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours.
* Ntondo has been replaced by Ingende in the chart due to new suspects in that area; no new suspects in Ntondo for >10 days.

Overall Epi:

- The total number of cases continue to fluctuate as new suspected cases are reported and subsequently ruled out with negative lab testing. An average of 20-30 alerts are evaluated each day; few have resulted in the identification of suspected cases.
- As of 18 June, the total number of cases has decreased from 64 to 62 (38 confirmed cases, 14 probable, 10 suspected), distributed in the following HZs: Bikoro (25 cases), Iboko (31 cases), Wangata (4 cases), and Ingende (2 cases). The total number of deaths among the total cases is unchanged at 28.
- The percentage of the total number of identified contacts being followed remains 96%.
- The date of the final date for contact tracing follow-up as informally announced by MoHP is 2 July, reflecting 21 days from 11 June. This is a working date and may change as further investigations continue or if there are additional confirmed cases. Please see figure below using data from MoHP and partners including WHO.

Date of symptom onset for confirmed and probable EVD cases by HZ and vaccination activity (data as of 17 June 2018)



Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi Update over past 24 hrs:

Bikoro HZ:

- Two (2) suspected cases tested negative for EVD.

Iboko HZ:

- One (1) new suspected case, a known contact of a probable case, was reported in Itipo.
- One (1) suspected case tested negative for EVD.

Surveillance / Survivors:

- A protocol to follow male survivors is in the process of being finalized in collaboration by WHO and partners.
  - A clinic for survivors was established in Bikoro on 15 June.
  - Access to this clinic remains a concern, as the majority of survivors are in Itipo, which is approximately 75 km from Bikoro. Additional clinics are being planned.
  - A WHO staff member will be arriving from Geneva to implement the protocol.

Laboratory

- A National Laboratory Strategy has been developed, focusing on GeneXpert for confirmatory testing in key sites such as Ebola Treatment Centers (ETC). GeneXpert is now fully functional in Bikoro Health Zone and Mbandaka. Additional GeneXpert machines are being sent to the affected areas.
- The Africa CDC has purchased six GeneXpert machines and some additional supplies for the response – they are currently awaiting customs clearance.
- US DoD USAMRIID team has arrived in country as of 15 June – they will be supporting the INRB in Kinshasa with a sequencer machine to perform genotype assays as this capability does not currently exist within DRC.
- WHO is shipping 300 RDTs to the nine targeted regional countries for preparedness.

Case Management

- The number of patients in treatment facilities and their distribution is as follows:

Treatment Facility	# Patients	
Mbandaka ETU	0	
Bikoro ETU	2	
Iboko transit center	0	
Itipo transit center	4	(+1)
Moheli transit center	0	(-1)
Ikoko Impenge transit center	0	(-1)
Total	**6**	**(-1)**

Changes (+/-) reflects net changes over past 24 hours.
The PEC/Surveillance Committees do not count suspects who have at least one negative PCR and are awaiting the second negative in total number of suspects.

- The overall number of patients currently in Ebola Treatment Unit (ETU)/isolation wards is six (6); there are no confirmed cases in treatment facilities at this time.
- On 16 June ALIMA started its activities in the transit center in Itipo, including 10 isolation units.
- A comprehensive triage plan for health facilities in Itipo health area has been developed.
- Planning has begun between the WASH and IPC committees for a simulation of an alert and transportation of a suspected patient from Maluku to the recently opened ETU in Kinkole near Kinshasa. An isolation tent has been constructed at Maluku. JICA is supporting this effort.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- In Bikoro, the Case Management and Surveillance committees discussed prepositioning of supplies in the event of identification of a case during community activities.
- In Mbandaka, trainings and data review are being done in health facilities to build health provider capacity in distinguishing between malaria and Ebola as cause of fever.
- On 13 June, a delegation visited the Centrale de Distribution Régionale (CDR) in Mbandaka, where stockpiles of essential drugs are being stored. These essential medicines were procured by DRC Human Development Systems Strengthening for Better Maternal and Child Health Results Project (PDSS) with funding from the World Bank in order to ensure free care in Ebola affected Health Zones. A plan for distribution of these drugs was jointly established by UNICEF and the Logistics Commission and has begun; 3 health facilities in the Wangata health zone have received drugs.
- Case management commission heads from Iboko and Bikoro are traveling to Mbandaka for the joint interim review of the response on 19 June.

Vaccine/Research

Ring Vaccination:

- According to MoHP, as of 18 June, a cumulative total of 3,017 people have been vaccinated, including 829 in Mbandaka, 726 in Bikoro, 1,374 in Iboko, 77 in Ingende, and 11 in Kinshasa.
- No vaccinations were given on 17 June as teams spent the day following up on contacts.
- On 14 June, MoHP announced that vaccine recipients in Kinshasa had received Ebola vaccinations; 5 people vaccinated in Kinshasa were caregivers of the MoHP emergency response team who were going to deploy to Ebola-affected areas to replace one of the on-site teams.
- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus–Zaire Ebola virus (rVSV-ZEBOV) vaccine in Mbandaka on 21 May.

Other investigational vaccines:

- On 13 June, a Chinese delegation, including one China CDC staff member, attended the lab commission meeting to share data on a recombinant Ebola vaccine called Ad5-EBOV that they are interested in offering for use in DRC. The data on phase 1 and phase 2 trials was shared with the Lab Commission as well as WHO and relevant MoHP entities. The decision of the Government of DRC on whether to allow the vaccine to be registered and used in DRC is pending.

Research:

- Please see information regarding survivor surveillance in Epi/Surveillance Section.

Psychosocial Issues, Communications & Social Mobilization

- On 12 June, meeting held between MSF, WHO and Red Cross to discuss strategic plan for addressing resistance to safe and dignified burials. The plan is being developed and finalized.
- Anthropologists have made recommendations on how to take into consideration socio-cultural beliefs in order to better sensitize the Batwa, such as avoiding having young men bury the elderly and to take into consideration gender when preparing bodies for burial. There continues to be resistance towards safe and dignified burials; community leaders (traditional chiefs and religious leaders) are being sensitized as a result.
- In Bikoro, there was a roleplaying exercise with the Relais communautaires (RECO)/and Community Action Committees (CACs) to practice handling rumors and resistance from community members.
- On the occasion of the World Day of the African Child on 16 June, UNICEF invited 32 children reporters of Bikoro to animate radio programs on the dignified and safe burial. The Minister of Health, who was in Bikoro that day, praised the initiative that allowed children to fully participate in the Ebola response
- In Iboko, training of 51 psychosocial assistants took place, from whom 16 were chosen to be hired by partners to continue psychosocial work on the ground.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- A special request for support was made for the vaccinated woman who delivered a premature infant – she requested clothing and items for herself and the infant, as well as access to clean water.
- The NGO Amani Global Networks donated $5,000 to MoHP for the Ebola response. The financial contribution was paid in full to the Association of Winners of the Ebola Virus Disease (ANVE) gathering all the survivors and the relatives of the victims to ensure better biological, psychological and social monitoring.

Response & Coordination

- On 12 June, CDC and USAID staff met with members from the Africa CDC to discuss response activities and possible collaborations during the response and beyond. The Africa CDC staff will continue to attend the lab commission meetings as well.
- On 13 May, the Japanese Ambassador to the DRC, presented the Japanese team of experts who will collaborate with the General Directorate of Fight against Disease as part of the government response against Ebola. This team will intervene in the areas of epidemiological surveillance at points of entry and the strengthening of mobile laboratories.
- USAID and CDC attended a partners meeting led by the Humanitarian Coordinator with WHO, UNICEF, MSF, IFRC, DFID, ECHO, IRC and IMC where coordination and preliminary lessons learned of the response were discussed. The importance of having a government led strategy that all partners supported was noted. In addition, contingency planning for the next Ebola response pulling on lessons learned was also discussed with key players.
- USAID participated in a day trip to Itipo, where meetings were held with the MOH and WHO coordination team. Donors including ECHO, DFID and the World Bank team visited the operational base which has been set up by MONUSCO, who provides logistical support. Discussions were held on the importance of a ring IPC strategy given the number of infected health workers in Itipo, as well as improved coordination, rapid response to alerts and the provision of free health services in affected health zones.
- USAID continues to meet with WHO, UNICEF and IFRC to discuss work plans and budgets, in alignment with the national strategic response plan.
- On 15 June, USAID and CDC staff attended a meeting hosted by ECHO, during which WHO staff members including the Incident Manager and the Director for Strategy, Planning and Performance Management presented:
    - The current status of funding in presence of major donors (including DFID, Canadian CIDA, and Swedish SIDA).
    - Information on M&E systems being used to track the response for a "midterm evaluation" of the response (planned for early July)
    - Plans for the "transition" and "resilience" phase of the response (three months each) for which no additional funding will be required
    - After-action evaluations and reporting, other lessons learned will be documented for purposes of better responding to the next outbreak and will be incorporated in future response plans for Equateur.
- CDC's Ebola Response Lead continues to hold meetings with the Minister of Health, partners including UNICEF, and the Incident Management team.
- CDC's Ebola Technical Expert continues to work in collaboration with MoHP and WHO in Bikoro and Itipo on improvements of surveillance processes and to review hospital and epidemiologic data to examine chains of transmission.
- CDC's Vaccine Specialist is continuing to observe ring vaccination processes with MoHP, WHO, MSF colleagues in Iboko Centre.
- CDC continues to provide technical assistance and advice through daily CNC meetings
- On 16 June, MoHP announced that the Minister of Health was visiting the field by car, traveling between Mbandaka, Bikoro, and Itipo, to see how the people and MoHP teams live and move from village to village during response.
    - During his stay in Itipo, the Minister participated in the training of community development cells.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

  - In Mbandaka, he held a meeting with the security committee of Equateur Province.
- WHO has developed a monitoring framework which includes key performance indicators for the response. This will be included in the 4Ws (What, Who, Where, and When) plan produced by OCHA.
- WHO is supporting neighboring countries to systematically assess and take action on Ebola preparedness, and to develop national contingency response plans.
  - A regional readiness and preparedness plan has been developed and published, outlining activities to ensure that the nine neighboring countries can detect and contain Ebola should it be introduced.
  - The regional readiness and preparedness plan requires $15.5 million.
  - WHO has provided a total of $1,729,000 to support implementation of key interventions of the 9 countries contingency plans on preparedness and readiness.
  - ROC MoH has been in contact with CDC and HHS/OGA regarding request for assistance; recommended reach out to WHO for process of RFA.
- The DRC Minister of Health met with his counterparts from the Republic of Congo and the Central African Republic during a teleconference from Kinshasa Emergency Operations Center on 12 June. The three ministers of health shared information regarding DRC outbreak, discussed the issue of cross-border collaboration and agreed that it was important to hold meetings between their respective technical teams more regularly. They plan to hold regional workshop on cross-border contingency plan to be complemented by full-scale simulation exercise of cross-border response.
- EOC Support:
  - Prior to the departure of WHO EOC Lead from DRC on 17 June, he assigned the CDC EOC consultant to be the covering WHO EOC Lead for the response. WHO EOC Lead also reiterated to the WR and IM in Kinshasa the need for continued CDC support to the EOC activities in country.
  - Mbandaka EOC updates:
    - Mbandaka EOC is running and providing:
      - Internet connection
      - Server capability
      - Meeting room for all response commissions – following discussions regarding EOC uses, the Mbandaka Surveillance Commission began utilizing EOC space in the main meeting room to conduct their daily data meeting.
      - Information sharing capability (screens and maps on the wall) - for situational awareness, the information from the surveillance meeting has begun to be displayed on the flat screens inside the Mbandaka EOC and also in a white board as a backup in case there is of power outage.
      - Break rooms and meetings rooms for all 8 commissions.
    - IMS is not being utilized in the response because of the use of the commission structure adapted by DRC Ministerial decree. Basic IMS training materials were developed. IMS and EOC 101 Training will be provided to MOHP staff on Tuesdays and Thursdays.
    - MSF and IFRC will assign liaison officers to the Mbandaka EOC for at least 3 days a week, with the intent to improve coordination and information sharing.
    - Mbandaka EOC Logistics continues to work on the purchase order for safety and security equipment already submitted through WHO. A small demonstration of 75 to 100 motorcyclist showed up at the EOC around 17:00 Hours (DRC Time) remained outside for about 10 minutes and left. This was not a violent demonstration but highlighted the need to have better trained staff at the gate. A meeting with the WHO and MONUSCO security is planned.
    - The Minister of Health arrived to the Mbandaka EOC yesterday 15 June, for an unexpected visit, the EOC Manager gave him a tour and explained what information was been shared on the EOC Screens.
    - On 18 June, a bottled water shortage in the Mbandaka was reported with no drinking water in any store in the city; OCHA, MSF, WHO, RC were reported to be having the same problem. WHO Logistics is trying to fix the problem by bringing water from Kinshasa.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

        - EOC Lead will fly to Iboko on Wednesday, 19 June to evaluate the coordination center and see what's needed to support the coordination efforts.
    - The Mbandaka field coordination center is being supported by:
        - The Mission de l'Organisation des Nations Unite pour la Stabilisation en Republique Democratique du Congo (MONUSCO), UN's Peace Keepers mission in DRC, who are providing generator and fuel for the center.
        - PATH is providing the implementation and purchase ability to revamp the facility and the installation of audiovisuals, internet, A/C, and other items.

WASH

- UNICEF/OXFAM has established a water supply at the General Hospital of Mbandaka. Oxfam has also built latrines at the General Hospital of Mbandaka and at the following health centers: Ipeko, Maman Elikya, Basoko and Losanganya.
- Discussions are underway with UNICEF to ensure there is a water supply at the General Hospital of Itipo.
- WHO is in the process of developing and signing subcontracts with IRC, IMC, and IFRC to continue IPC activities across the three affected health zones. These organizations have been scaling up these activities in anticipation of these agreements and many assessments and IPC training activities have already occurred. The activities will continue to follow the guidelines and minimum package of services for IPC, Triage, and WASH previously agreed upon by these organizations with UNICEF and USAID.
- Red Cross is finalizing rehabilitation of an operational base for dignified and safe burials in Bikoro.
- Training on infection prevention and control, handwashing, and preparation of chlorinated solution was done with 500 policemen in Mbandaka, as well as follow up of 15 handwashing stations given to restaurants.

Border Health (BH)

- **Countries Reported by Various Sources to Have Implemented Entry Screening (23)**

Angola	Gabon	Mozambique	Tanzania
Botswana	Gambia	Nigeria	Thailand
Cameroon	Ghana	Republic of Congo (Congo-R)*	Vietnam
Central African Republic	Kenya	Rwanda	Uganda
China	Malawi	Seychelles	Zambia
Ethiopia	Mali	South Sudan	

*Provided through US Embassy cable. Previously not understood to have implemented entry screening. Both entry and exit scanning are reportedly being conducted in Kinshasa and Brazzaville. There are no known passenger flights from Kinshasa to/from Brazzaville.

- In DRC, screening at the main entry points of travelers continue. On 18 June, 3,338 people were screened across the equipped points of entry: 463 in Bikoro, 2,072 in Mbandaka and 803 in Kinshasa.
- The alert reported in the port of Sacre Coeur (Mbandaka) with the finding of the body of a 40 year-old man from north of Mbandaka remains under investigation to determine whether or not he was in contact with a known or probable case. The family refused for testing to be done, and an unsafe burial was performed. All other previous alerts have been closed.
- The CDC Border Health Team participated in a stakeholders meeting at Ndjili International Airport to discuss exit screening strategies for the international terminal. The meeting was led by the director of PNHF and the Ndjili airport director. Multiple stakeholders attended including, immigration and customs officials, border police, port health, two commercial airlines, CDC, IOM, and JICA. Support was expressed for PNHF to supplement exit screening in collaboration with airport and international partners. Since the discussion were high -level and not

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

all stakeholders could attend, follow-on meetings will be planned to further guide setup and evaluation of the process.

- Following the meeting, airport and border health staff, CDC, IOM, and JICA conducted a walk-through of the international terminal and discussed possible exit screening strategies. More details are to be determined in regards to the level of screening to implement now, how it should be modified in the event that cases are reported in Kinshasa, and when it should be deactivated.
- A CDC Border Health team member arrived on Sunday 17 June, and spent 18 June on the WHO badging process and meeting counterparts. The focus of this deployment will be assisting in the development of scalable exit screening strategies at Ndjili Airport in Kinshasa based on current outbreak parameters and risk factors.
- Fifty (50) FETP frontline personnel were trained on 15-16 June to serve as supervisors for POE screeners; training covered primary and secondary screening methodology.

Deployment & Logistics

- USAID's Medical Officer has extended her TDY through the end of the month (flying back on 1 July). The second Medical Officer will be returning by the end of this week (22 June). They will be replaced by a USAID/Guinea GHSA Advisor on 30 June and a Medical Officer on 1 July. The deployed persons will continue to support the USAID mission in the Ebola Response on the following activities: Technical Advice, Communications Technical Assistance, USAID partner management, and Incident Command.
- Two NIAID clinicians who were deployed to DRC to train INRB staff on mAb114 administration will depart DRC mid-week.
- As of 19 June, nine CDC staff are deployed to DRC, three to provide support to CDC-DRC country office and six under the auspices of GOARN (Technical Advisor, Border Health, Vaccine, EOC, and Epi (2 persons).
- The CDC Ebola Response Lead in DRC transitions to the CDC Country Director on 20 June.
- One CDC Border Health staff member returned to Atlanta and another was deployed in her place.
- Additional CDC deployments are pending confirmation and may include one person to provide epi support as part of GOARN team with tentative departure date on 23 June.
- GOARN is in the process of re-evaluating and prioritizing needs for further deployments due to significant restructuring of the response in the past few days.
- WHO has deployed four experts in priority 1 countries (Congo: 2 risk communication) and (CAR: 1 risk communication and 1 epidemiologist) to support regional preparedness activities.
- The NGO Amani Global Networks donated 50 bicycles to MoHP for the Ebola response; they will go to the various affected HZs to facilitate the movement of surveillance teams in the field.

Challenges

- Resources for response personnel in the field are limited; additional resources are being mobilized and efforts for further improvements continue.
- MoHP expressed concern regarding the high volume of responders in the area; proposed candidates will be further screened and prioritized.

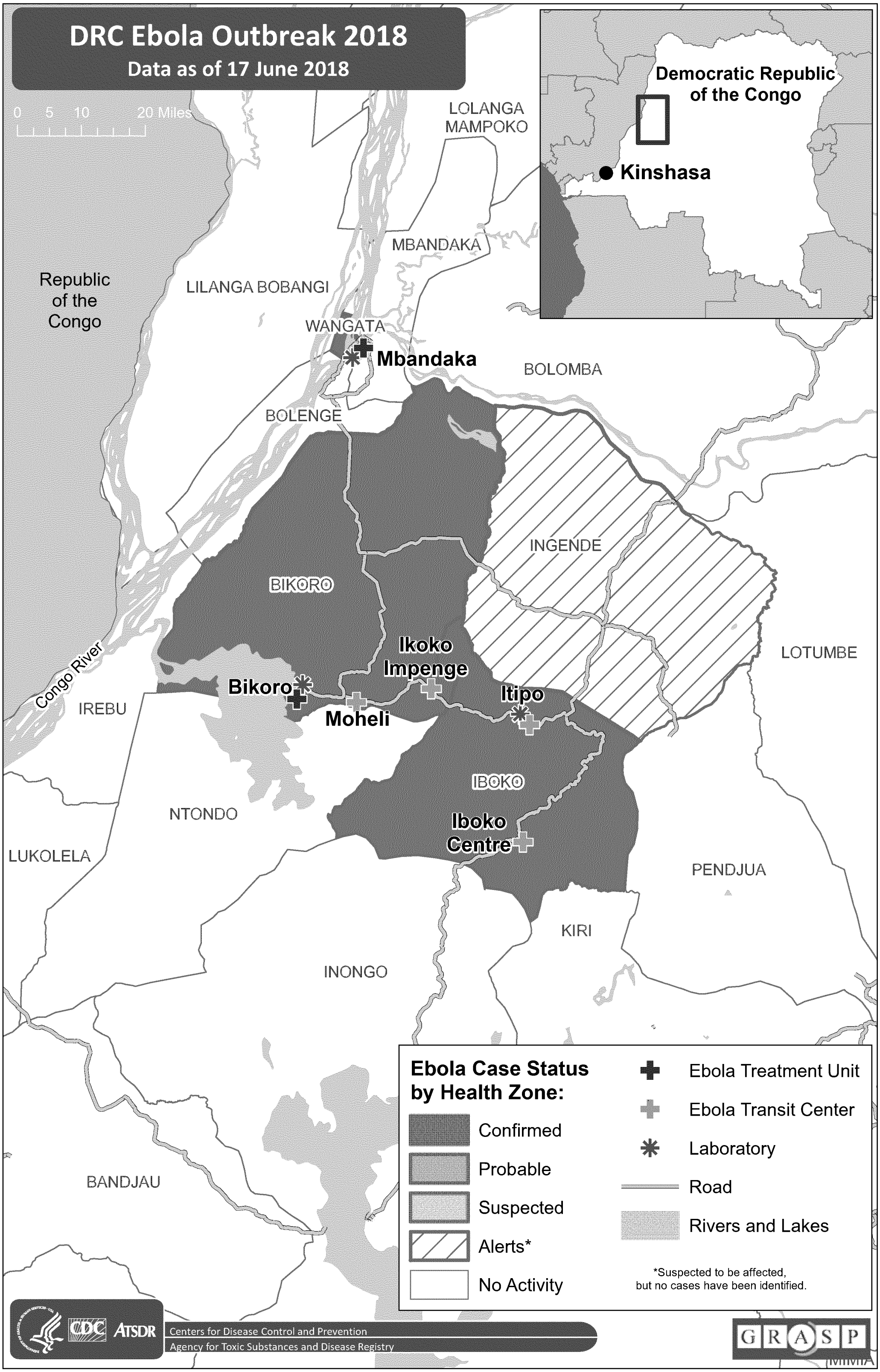
Note: USG SYNC call frequency has been changed to once every two weeks. The next call is scheduled for 27 June. USG SitRep dissemination frequency has been changed to once weekly on Tuesday. The next USG SitRep will distributed on 26 June.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Abbreviations

ALIMA: Alliance for International Medical Action, medical humanitarian NGO
ANVE: Association of Winners of the Ebola Virus Disease
CAC: Community Action Committees
CIDA: Canadian International Development Agency
CNC: Comité National de Coordination (National Coordination Committee)
DFID: Department for International Development, United Kingdom
ECHO: European Civil Protection and Humanitarian Aid Operations, European Commission
ETC/ETU: Ebola Treatment Center/Ebola Treatment Unit
FETP: Field Epidemiology Training Program
GOARN: Global Outbreak Alert and Response Network
HZ: Health Zones
IFRC: International Federation of Red Cross and Red Crescent Societies
IMC: International Medical Corps
IPC: Infection prevention and control
IRC: International Rescue Committee
INRB: Institut National de Recherche Biomédicale, Kinshasa, Democratic Republic of the Congo
IOM: International Organization of Migration, UN
JICA: Japan International Cooperation Agency
MONUSCO: Mission de l'Organisation des Nations unies pour la stabilisation en République démocratique du Congo (United Nations Organization Stabilization Mission in the Democratic Republic of the Congo)
PDSS: DRC Human Development Systems Strengthening for Better Maternal and Child Health Results Project
PNHF: Programme National de l'Hygiene aux Frontieres
POE: Port of Entry
RDT: Rapid diagnostic test
RECO: Relais communautaires
SIDA: Swedish International Development Cooperation Agency

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO


DRC Ebola Outbreak 2018
Data as of 17 June 2018
0 5 10 20 Miles
Democratic Republic of the Congo
Kinshasa
Republic of the Congo
LOLANGA MAMPOKO
MBANDAKA
LILANGA BOBANGI
WANGATA
Mbandaka
BOLOMBA
BOLENGE
INGENDE
BIKORO
Ikoko Impenge
LOTUMBE
Congo River
Bikoro
Moheli
Itipo
IREBU
IBOKO
NTONDO
Iboko Centre
LUKOLELA
PENDJUA
KIRI
INONGO
BANDJAU
Ebola Case Status by Health Zone:
Confirmed
Probable
Suspected
Alerts*
No Activity
Ebola Treatment Unit
Ebola Transit Center
Laboratory
Road
Rivers and Lakes
*Suspected to be affected, but no cases have been identified.
CDC ATSDR
Centers for Disease Control and Prevention
Agency for Toxic Substances and Disease Registry
GRASP

From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 6/8/2018 12:55:16 PM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Brownsteindp@state.gov; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; roderick.davis3.mil@mail.mil; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
CC: GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC Ebola USG Sitrep 30_ 8 June 2018
Attachments: DRC Ebola USG sitrep 30_8 June 2018.docx

Dear Colleagues,

The subject SitRep is attached. Thanks to the institutions noted in the footnote that contributed.

Best.
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

8 JUNE-2018

SITREP #30

INTERNAL USG USE ONLY

62	38	14	10	27	564 / 619 (91 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

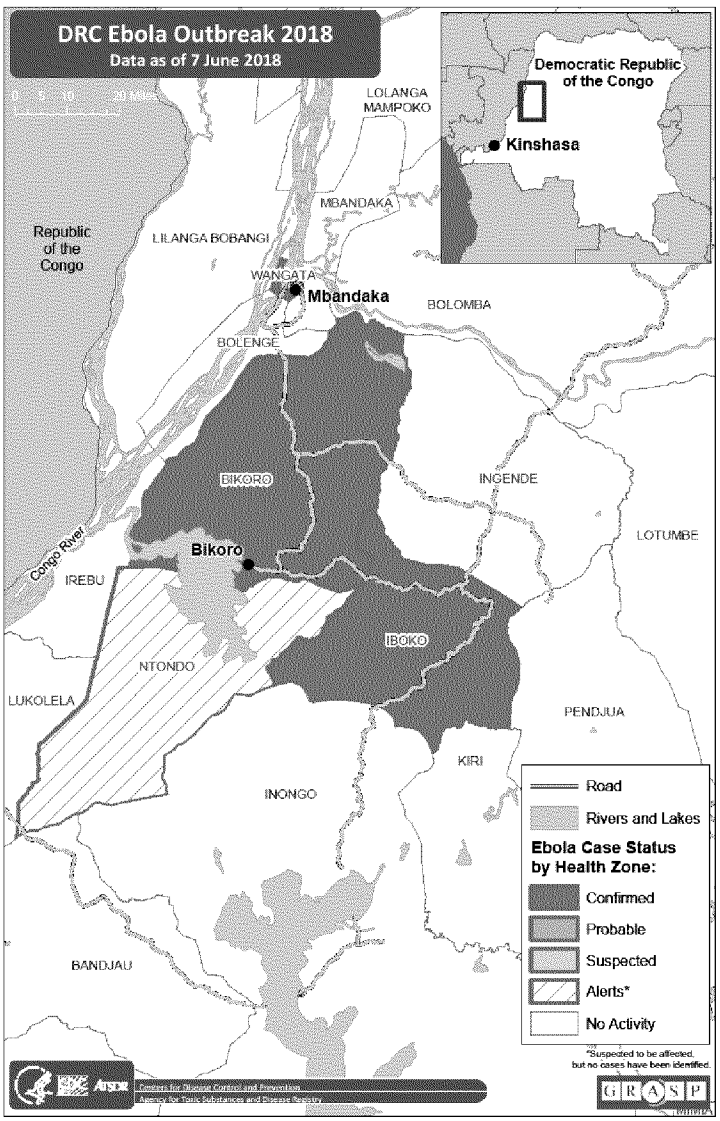
Provisional Case Counts - DRC MoHP Press Release dated 7 June 2018. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province in Northwest DRC.

The three health zones (HZ) reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). One new confirmed case was reported on 6 June in Iboko. Surveillance for cases, contact tracing and investigations continue; the total number of contacts has decreased and contact-monitoring indicators show early signs of improvement. Three suspected cases have left treatment facilities against medical advice (AMA) over the past few days (two on 4 June, one 6 June); all three have subsequently tested negative for EVD.

On 21 May 2018, the MoHP launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak. Vaccinations have also been administered in HZs of Bikoro, Iboko, and Ingende (where numbers were provided for the first time on the MoHP press release dated 6 June).



Double click to enlarge map

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

Health Zones (HZ)	Cases					Deaths	Contacts					
	Confirmed	Probable	Suspected			Total	Total	# Followed		Total		% Followed	
Bikoro	10	11	2	(+2)	(-2)	23	18	116	(+19)	117	(-25)	99	(+31)
Iboko	24 (+1)	3	5		(-1)	32	6	378	(+66)	411	(+64)	92	(+2)
Wangata	4	0	3	(+3)	(-1)	7 (+2)	3	70	(-67)	91	(-51)	77	(-20)
Ntondo	0	0	0			0	0	0		0		0	
Total	**38** (+1)	**14**	**10**	(+5)	(-4)	**62** (+2)	**27**	**564**	(+18)	**619**	(-12)	**91**	(+5)

Provisional Case Counts – DRC MoHP Press Release dated 7 June 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours.

Overall:

- As of 7 June, the total number of cases has increased to 62 (38 confirmed cases, 14 probable, 10 suspected), distributed in the following HZs: Bikoro (23 cases), Iboko (32 cases), and Wangata (7 cases). The total number of deaths among the total cases remained at 27.
    - One (1) new confirmed case was reported in Iboko on 6 June (details below).
    - Five (5) new suspected cases were reported, all among known contacts.
    - Four (4) suspected cases tested negative for EVD.
    - The percentage of the total number of identified contacts being followed increased from 87% to 91%.

Bikoro HZ:

- Two (2) new suspected cases were reported.
- Two (2) suspected cases tested negative for EVD.

Iboko HZ:

- One (1) new confirmed case was reported on 6 June.
    - She was from Bokongo (aire de sante, health area), where there have not been any cases since the start of the outbreak.
    - The confirmed case developed symptoms on 2 June.
    - The case is currently being transported to the closest ETU.
    - Her mother, a known case, died on 20 June.
- One (1) suspected case tested negative for EVD.

Wangata HZ (in city of Mbandaka):

- Three (3) new suspected cases were reported.
- One (1) suspected case tested negative for EVD.

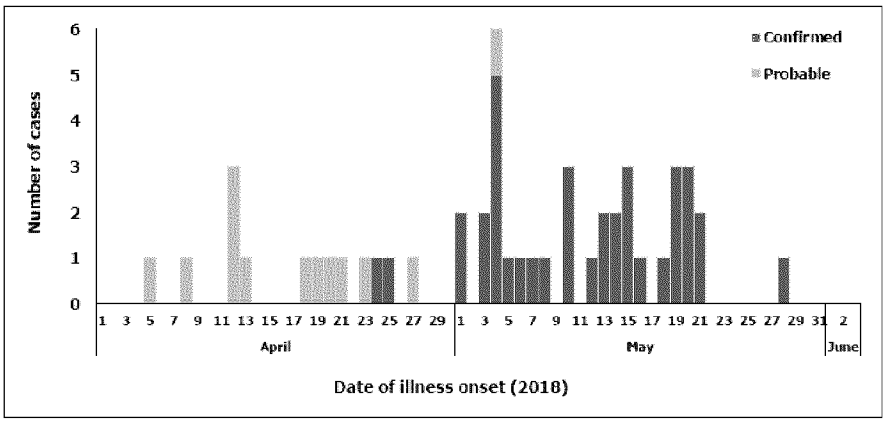
Earlier in the week:

- MoHP press release on 6 June indicated the number of probable cases had increased by one (in Iboko HZ) from 13 to 14.
    - This probable case was reported in Itipo, in a Batwa who died on 3 June.
    - The person was a known contact of an earlier probable case in Itipo who was a "superspreader" and was lost to follow-up.
    - An unsafe burial took place.
    - Vaccination efforts for the affected village are ongoing.
- Also per MoHP on 6 June, one (1) death was reported in a confirmed case in the Bikoro ETU, increasing the number of deaths by one.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- An epi curve was published in the latest [HYPERLINK "http://apps.who.int/iris/bitstream/handle/10665/272761/SITREP-EVD-DRC-20180605-eng.pdf?utm_source=Newsweaver&utm_medium=email&utm_term=click+here+to+download+the+complete+situation+report&utm_content=Tag%3AAFRO%2FWHE%2FHIM+Outbreaks+Weekly&utm_campaign=WHO+AFRO+-+Situation+Report+-+Ebola+Virus+Disease+Outbreak+in+DRC+-+Sitrep+08+%282018%29"] (the most recent probable and confirmed cases reported after 2 June are not depicted).

Figure 1. Epidemic curve for Ebola virus disease outbreak in Equateur Province, Democratic Republic of the Congo, 3 June 2018 (n=50)



Laboratory

- No new updates

Case Management

- The number of patients in treatment facilities and their distribution is as follows

Treatment Facility	# Patients	
Mbandaka ETU	0	
Bikoro ETU	1	
Iboko transit center	0	(-1)
Itipo transit center	4*	
Moheli transit center	0	
Ikoko Impenge transit center	0	(-6)
Total	**5**	**(-7)**

Changes (+/-) reflects net changes over past 24 hours.
* Three (3) non-cases are waiting to be discharged, but are still hospitalized

- The overall number of patients currently in Ebola Treatment Unit (ETU)/isolation wards, has decreased to 5.
- Per MoHP press release on 6 June, one (1) new suspected case left against medical advice (Ikoko-Impenge); earlier on 4 June, two (2) suspected cases in Bikoro HZ were lost to follow-up as they left the treatment center against medical advice (Moheli and Ikoko-Impenge); all three cases have subsequently tested negative for EVD.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Vaccine/Research

Ring Vaccination:

- According to MoHP, as of 7 June, 1,826 people have been vaccinated, including 673 in Mbandaka, 398 in Bikoro, 725 in Iboko and 30 in Ingende.
- The MoHP noted that under Congolese legislation, any use of investigational vaccines must be authorized by the Scientific Committee and the Ethics Committee. To date, only the rVSV-ZEBOV vaccine has been authorized by these committees as part of the current Ebola outbreak.
- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus – Zaire Ebola virus (rVSV-ZEBOV) vaccine in Mbandaka on 21 May.

Therapeutics:

- WHO has requested 10 treatment courses of Mapp Bio's ZMapp product. ZMapp is a combination of three monoclonal antibodies that was evaluated in the PREVAIL II trial in West Africa and showed a trend in benefit but missed the primary endpoints due to the declining number of cases. BARDA is working closely with Mapp Bio on all requests and shipments. Expanded Access Protocol has been approved and as of 6 June, 5 treatment courses are in Bikoro and 5 remain in Kinshasa.
- WHO has requested 10 treatment course of Regeneron's REGN-EB3 product. REGN-EB3 is a combination of three, fully humanized, monoclonal antibodies that has completed a Phase I and has shown efficacy equivalent to ZMapp. BARDA is working closely with Regeneron on all requests and shipments. Product arrived in DRC on 4 June. On 5 June, the sponsor was informed the product was transferred to the "infusion center". As of 6 June, Regeneron is waiting for Expanded Access Protocol approval.
- According to WHO, on 4 June, an ethics committee in the DRC approved the use of five investigational therapeutics to treat Ebola, under the framework of compassionate use/expanded access.
    - At present, clinicians working in the treatment centers will make decisions on which drug to use as deemed helpful for their patients, and appropriate for the setting. The treatments can be used so long as informed consent is obtained from patients and protocols are followed, with close monitoring and reporting of any adverse events.
    - A WHO working group with representation from INRB, NIAID, BARDA and FDA is designing a randomized clinical trial protocol to evaluate investigational therapeutics, which could be implemented if the outbreak expands.
    - Four of the five approved drugs are currently in the country. They are ZMapp, GS-5734, REGN monoclonal antibody combination, and mAb114.

Diagnostics:

- WHO has requested a total of 1,750 rapid diagnostic test kits from OraSure. OraQuick is their Ebola RDT, point of care lateral flow diagnostic. OraQuick has been granted EUA status by the FDA for whole blood from individuals suspected of EVD or cadaveric oral fluid. BARDA is working closely with OraSure on all requests and shipments. 250 kits were shipped on 16 May and an additional 1500 kits were shipped on 29 May. Of the 1500 kits, WHO requested 500 be shipped to Geneva and 1000 were shipped to Kinshasa.

Research Response Agenda (Geneva): On June 6th, WHO and the DRC convened a consultation in Geneva on the draft research response agenda (with representation from NIAID, BARDA, FDA, CDC and OGA). Key take aways were as follows:

- DRC leadership expressed interest in building research capacity and a commitment to partnership.
- Given repeated EVD outbreaks, there was agreement that clinical protocols that enroll across outbreaks may be beneficial.
- Survivor studies: Coordination of existing survivor protocols and enrollment in DRC were recommended

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- Therapeutics: Unless the outbreak expands, investigational drugs will likely be used under compassionate use protocols. Further consultation to hone the draft therapeutics randomized clinical trial protocol was recommended.
- Vaccines: Interest in additional vaccine candidates was voiced, esp. those with different characteristics (e.g., durability, contraindications). There was consideration of extending the PREVAC Merck rVSV-ZEBOV vs. Janssen/Bavarian Nordic Ad26/MVA vs. placebo protocol to the DRC region.

Communication & Social Mobilization

- In Itipo, MOHP with UNICEF have provided briefings with all Batwa leaders, religious leaders of all 44 villages, educators from all 115 schools.
- Communication teams are being integrated with surveillance teams in order to conduct active case finding.
- Trained community communicators in Mbandaka Health Zone are involved in door-to-door awareness raising activities on a daily basis.
- A briefing was conducted for 50 media personnel in Mbandaka and Bikoro on communicating the risks of EVD during the outbreak and how journalists can engage with responders in addressing rumors and community concerns.
- On June 6, 2018, teams of communicators from the MoHP, WHO and UNICEF organized an awareness session for 50 traditional healers (traditional doctors) of the city of Mbandaka.
- In the neighboring provinces of South and North Ubangi, DRC, UNHCR is continuing to supporting MoHP with social mobilization and door-to-door sensitization on EVD prevention in the refugee camps.
- The WHO document, "Risk communication and community engagement (RCCE) considerations: Ebola response in the Democratic Republic of the Congo" was finalized and made available 7 June.

Response & Coordination

- MoHP announced that on June 8, 2018, a team of Chinese experts will arrive in Kinshasa to assist the Congolese health authorities in the response to EVD. Like other international experts who come to support the Congolese experts, they will participate in the various commissions set up to manage the response.
- DOS indicated that after U.S. officials suggested Taiwan contribute to global efforts to combat Ebola during a bilateral meeting on the sidelines of the World Health Assembly, Taiwan President Tsai Ing-wen announced Taiwan would donate USD $1 million to the WHO. Taiwan's mission in Geneva made a formal offer May 31; WHO has not responded.
- USAID supported contributions continue and can be updated as follows:
    - PPE: From USAID-funded stockpiles, WHO and the Food and Agriculture Organization (FAO) have provided over 18,000 PPEs, universal protection items, disinfectants, and support materials to be used at health facilities and hospitals in the affected areas. The latest shipment from WHO, meant to cover 2 months of supply needs, arrived in Kinshasa on May 27 and was sent to Mbandaka on June 1, to be distributed to primary and secondary health facilities in the affected areas.
    - Interagency: The USAID mission provides workspace for CDC surge personnel, demonstrating strong interagency collaboration in the field.
    - TDY and Field visits: Two USAID technical experts (1 incident command and 1 WASH expert) will travel to Mbandaka Friday, 8 June through Wednesday, 13 June. They will assess IPC capacity, logistics, connectivity and communication, and response coordination.
- WFP, in collaboration with MoHP, indicates that the planned number of beneficiaries for food assistance to Ebola-affected populations are:
    - Food assistance to 4,000 contacts under surveillance during 21 days.
    - Nutritional assistance to 90 discharged cases from Ebola Treatment Centers during 14 days.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

  - Food assistance to 450 family members of discharged cases during three months.
- The field-level agreement for food distributions by Oxfam was signed. Oxfam will work closely with health workers to provide this support.

WASH

- WHO, MSF, Oxfam, and IFRC have created a harmonized protocol for safe and dignified burials.
- As of 5 June, IFRC indicates that eleven safe and dignified burials have been conducted.
- MoHP supported dignified burial for a woman who died in Itipo. In Mbandaka, psychological support was provided to a widow and three orphans of a person who died.
- An infection prevention and control assessment was conducted in Ikoko Impenge and Moheli health centers and several gaps were identified, including lack of knowledge, lack of personal protective equipment and inadequate waste management.
- WHO and partners developed a new IPC protocol that will be used by all partners conducting IPC activities.

Border Health (BH)

- **Countries Reported to Have Implemented Entry Screening (23)**

Angola	Gabon	Mozambique	Tanzania
Botswana	Gambia	Nigeria	Thailand
Cameroon	Ghana	Republic of Congo (Congo-R)*	Vietnam
Central African Republic	Kenya	Rwanda	Uganda
China	Malawi	Seychelles	Zambia
Ethiopia	Mali	South Sudan	

*Provided through US Embassy cable. Previously not understood to have implemented entry screening. Both entry and exit scanning are reportedly being conducted in Kinshasa and Brazzaville. There are no known passenger flights from Kinshasa to/from Brazzaville.

- In DRC, screening at the main entry points of travelers continue. On 7 June, 3,326 people were screened across the equipped points of entry (POE): 488 in Bikoro, 1,673 in Mbandaka (11 ports, airport, and 1 parking), and 1,165 in Kinshasa.
- The POE team developed terms of reference on behalf of the National Program of Hygiene at Borders (PNHF) for a cascade training of trainers on POE exit and entry screening as well as training materials in collaboration with WHO and CDC DRC.
  - CDC Border Health Team worked with WHO, PNHF, and other agencies to refine the content, organization, and duration of the upcoming train-the-trainers session. A one-day session, originally planned for Saturday, 9 June, was determined insufficient to train the primary trainers, given material that would need to be covered for both airports and other POEs (ports, markets, and bus stations). Thus, training for the first group of trainers will be expanded to 2 days and occur 11-12 June. The new schedule allows organizations more time to create and print training materials for the trainees and for the POEs.
  - FELTP Fellow working with CDC drafted slide materials for various Ebola-related topics, which were well-received by planning group. CDC Border Health Team will complete other POE-related slides in preparation for compiling the final training slide sets at the planning meeting on 8 June.
  - Some topics to be emphasized during the training include issues that have been identified during recent weeks of surveillance and POE data reporting and include:
    - Clarification of the current Ebola case definition.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

  - Clarification of the definition of a "screened traveler". Screening numbers currently being reported from POEs may not be limited to travelers who've gone through the entire screening process (temperature check, visual observation of signs/symptoms, and filling out the health declaration form).
- Rumors are circulating of a potential border closure with Angola, but possibly due to political tension rather than perceived Ebola risk.
- A functional exercise will take place Friday June 8th at Ndolo Airport. The exercise will focus on the evacuation of ill persons to an ETU.
- CDC spoke with response managers from Samaritan's Purse on 7 June. Currently, Samaritan's Purse does not have plans to deploy HCWs for the DRC Ebola response but will connect with CDC should that change. If they do deploy workers, the organization's occupational medicine group has a monitoring plan in place that would actively engage with returning workers to support fever self-monitoring with notification of the organization if symptoms occur. The organization will work with local public heath to facilitate notifications and appropriate assessments.

Deployment & Logistics

- As of 8 June, nine CDC staff are deployed to DRC, four to provide support to CDC-DRC country office and five under the GOARN auspices (Technical Advisor, 2 Border Health, Vaccine and EOC). Additional CDC deployments include three persons as part of GOARN response with tentative departures as follows: 1 person for Border Health (9 June), and 2 persons for Epi/Surv (9 and 16 June).
- As of 8 June, two NIAID clinicians are deployed to DRC to train INRB staff on mAb114 administration.
- As of 4 June, WHO has deployed 171 technical experts to support response activities, including 27 experts from Global Outbreak Alert and Response Network (GOARN) partner institutions.
- GOARN and the AFRO operational partners' team have supported the deployment of three experts (IPC, Case Management and Epi surveillance) in Brazzaville to reinforce some aspects of preparedness that were highlighted in the national contingency plan.
- On behalf of WHO, UNHRD airlifted five 4x4 vehicles (Land Cruisers) to Kinshasa on 1 June 2018.

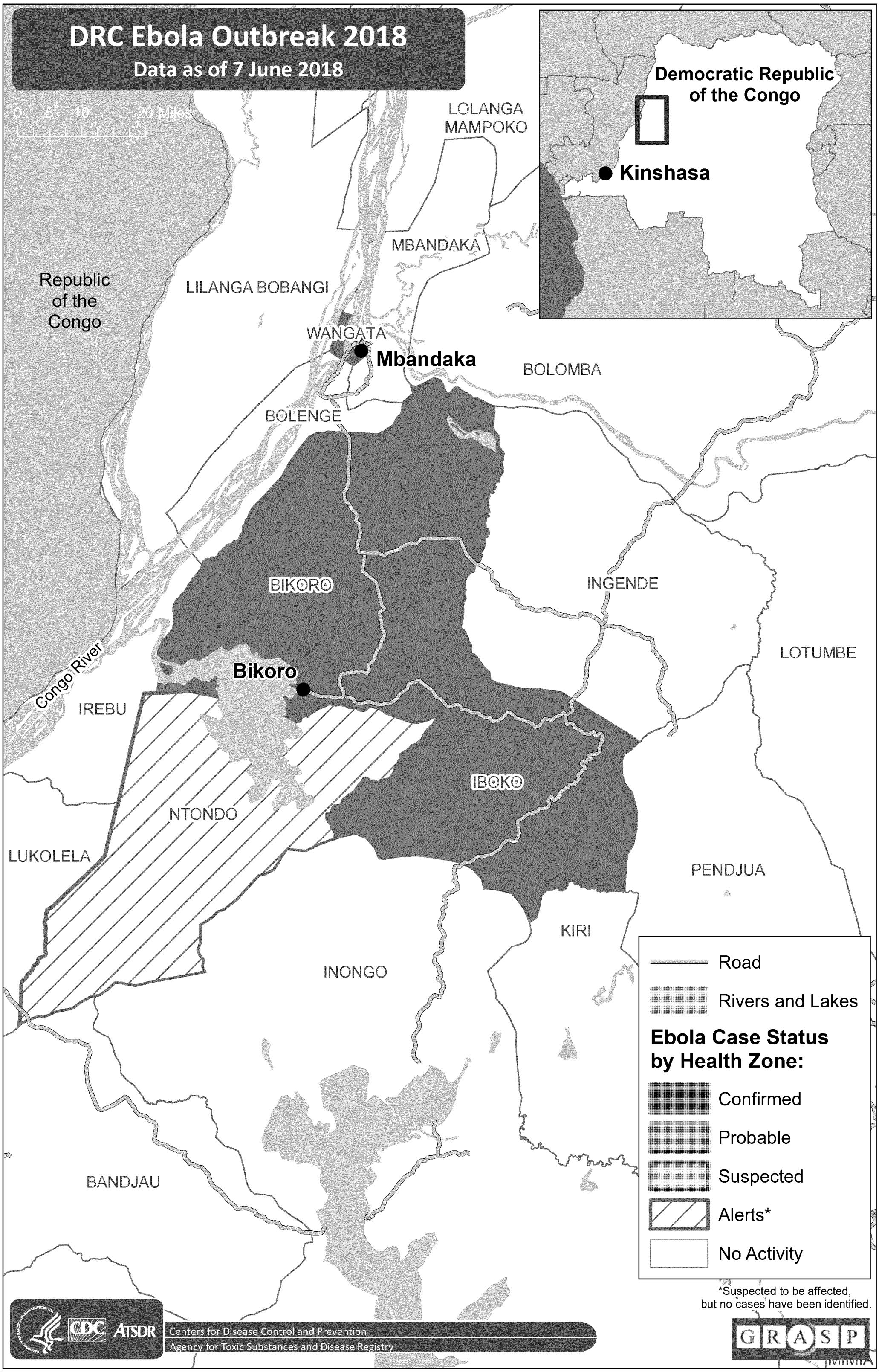
Challenges

- Resources for response personnel in the field is limited; efforts to mobilize additional resources are underway.
- Challenges to contact tracing due to logistical issues, including communication, associated with heavily forested and remote areas continue to be addressed.

Sources: CDC, BARDA, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 7 June 2018



From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 6/5/2018 11:28:37 AM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6)@nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Brownsteindp@state.gov; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6)@omb.eop.gov; (b)(6)@omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6)@ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6)@ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6)@nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6)@nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6)@nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6)@omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6)@nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6)@nsc.eop.gov; RBoyer@usaid.gov; (b)(6)@ovp.eop.gov; rgreene@usaid.gov; roderick.davis3.mil@mail.mil; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6)@nsc.eop.gov; (b)(6)@omb.eop.gov
CC: GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC Ebola USG Sitrep 27_ 5 June 2018
Attachments: DRC Ebola USG sitrep 27_5 June 2018.docx

Dear Colleagues,

The subject SitRep is attached. Thanks to the institutions that provided content.

Thanks.
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
Emergency Response and Recovery Branch

Division of Global Health Protection
Center for Global Health
Centers for Disease Control and Prevention

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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

5 JUNE-2018

SITREP #27

INTERNAL USG USE ONLY

56	37	13	6	25	490 / 938 (52 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

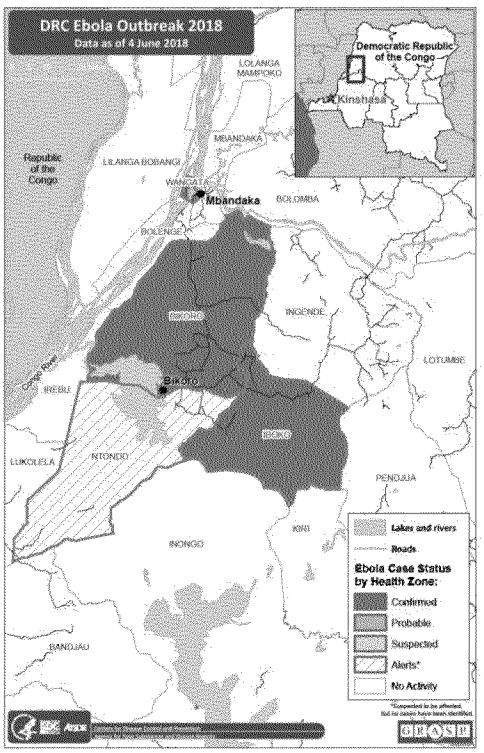
Provisional Case Counts - Data as of 4 June 2018 in DRC. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province in Northwest DRC.

The three health zones (HZ) reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). Surveillance for cases, contact tracing and investigations continue. MoHP with WHO and CDC and other partners are working to address the issue of suboptimal contact monitoring indicators due to communications challenges presented by the heavily forested areas. The villages of Iboko and Itipo remain the main points of concern.

On 21 May 2018, the MoHP launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak.



Double click to enlarge map

Epi/Surveillance

Health Zones (HZ)	Cases				Deaths	Contacts		
	Confirmed	Probable	Suspected	Total	Total	# Followed	Total	% Followed
Bikoro	10	11	5 (+5)	26 (+5)	17	116 (-13)	160 (+1)	73 (-9)
Iboko	23	2	0 (-3)	25 (-3)	5	237 (+61)	606 (+20)	39* (+9)
Wangata	4	0	1 (+1)	5 (+1)	3	137	172 (-15)	80 (+6)
Ntondo	0	0	0	0	0	0	0	0
Total	**37**	**13**	**6** (+6) (-3)	**56** (+3)	**25**	**490** (+48)	**938** (+6)	**52** (+5)

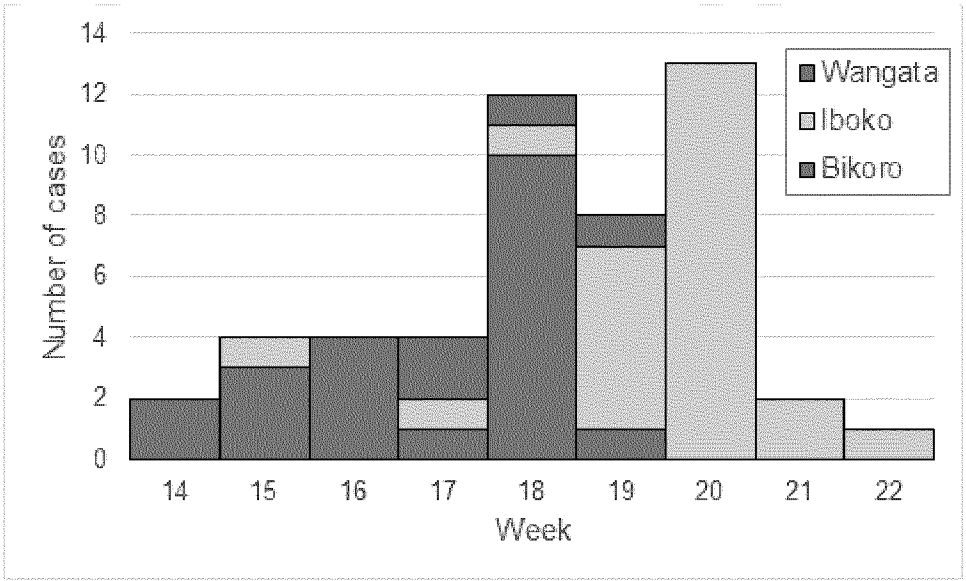
Provisional Case Counts – DRC MoHP Press Release dated 4 June 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours.
*Partial data; in Itipo, 237/268 contacts were followed (88% coverage)

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Overall:

- As of 4 June, the total number of cases has increased to 56 (37 confirmed cases, 13 probable, 6 suspected), distributed in the following HZs: Bikoro (26 cases), Iboko (25 cases), and Wangata (5 cases). The total number of deaths among the total cases remains unchanged at 25.
- Two (2) suspected cases were lost to follow-up as they left the treatment center against medical advice (Moheli and Ikoko-Impenge); specimens have been collected and laboratory results are pending.
- Six (6) new suspected cases were reported in the past day; all were among known contacts.
- The percentage of the total number of identified contacts being followed increased from 47% to 52%. The contact tracing efficiency is currently better than reported above because of delays in communicating data from field locations. Nonetheless, efforts remain ongoing to improve contact monitoring.
- The last confirmed case was reported in Iboko with onset date of 28 May. Please see below for the latest provisional epidemic curve up to EW 22:

Confirmed and Probable EVD Cases by Week of Onset, DRC, 2018



Bikoro HZ:

- Five (5) new suspected cases were reported among known contacts.

Iboko HZ:

- Three (3) suspected cases reported yesterday tested negative for EVD.

Wangata HZ (in city of Mbandaka):

- One (1) new suspected case was reported among known contacts.
- The woman (confirmed case) who had run away from the Wangata ETU on 19 May has been found and is healthy. At the time she departed from the ETU, one PCR test had yielded a negative result and a second PCR test was about to be conducted as part of discharge planning. She was deemed not to be a risk to the community at the time she fled. Identified contacts were followed.

Laboratory

- As of 2 June, GOARN has deployed a total of 12 technical experts in the field. Through the Emerging and Dangerous Pathogens Laboratory Network (EDPLN), there are several offers of laboratory support: eight from US CDC, three from UK, three from EDCARN, and one from Senegal.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- As of 5 June, there are currently three functional mobile labs in Mbandaka, Bikoro, and Itipo using GeneXpert assays for Ebola testing. The field lab in Iboko is being set up and not yet operational.

Case Management

- The number of patients in treatment facilities and their distribution is as follows

Treatment Facility	# Patients	
Mbandaka ETU	1	(+1)
Bikoro ETU	10	(-2)
Itipo transit center	2	(-3)
Moheli transit center	2	(-1)
Ikoko Impenge transit center	3	(+2)
Total	**18**	**(-3)**

Changes (+/-) reflects net changes over past 24 hours.
(Ikoko Impenge is in Iboko health zone)

- The number of patients currently in ETUs (includes isolation wards), has decreased from 21 to 18.
- Two survivors were discharged from the Bikoro ETU.
- MSF has set up isolation facilities in Mbandaka's main hospital (20 beds) and Bikoro hospital (15 beds).
- Two Ebola treatment centers (ETC) are being set up in Iboko and Itipo.
- On 2 June, MoHP reported that nine (9) patients with confirmed EVD have been cured and discharged.
- The commissions of care and psychosocial follow up have launched the National Association of Ebola Winners (ANVE) to bring together all the survivors to ensure a better biological, psychological, and social monitoring.
- The commission continues to provide support to families of victims, case contacts, patients in ETUs, and those who have been discharged from ETUs.
- From the beginning of the outbreak (4 April 2018) until 30 May, a total of five health care workers have been affected, with four confirmed cases and two deaths.
- An assessment and rapid scale up of triage, screening and infection prevention and control (IPC) at health facilities continues, with the goal to protect healthcare workers and maintain essential health services to the population. Healthcare workers are being oriented on managing triage and practicing IPC procedures.
- Clinical teams from the Emergency Medical Teams (EMTs) from IMC and IRC have been deployed in Mbandaka to support IPC and maintenance of safe access to essential health services. The IFRC is also planning for the deployment of additional clinical medical teams for supporting the case management pillar of the response.
- The Norwegian government is providing a donation of three EpiShuttles to the World Health Organization (WHO) for use in DRC. The EpiShuttle is a single-patient isolation system, specially designed for transport of patients. A team of specialists from the Oslo University Hospital CBRN unit will give essential training in using the equipment.

Vaccine/Research

Ring Vaccination:

- According to MoHP, as of 4 June, a total of 1,199 people have been vaccinated, including 577 in Mbandaka, 299 in Bikoro and 323 in Iboko.
- Front line workers continue to be a large proportion of persons who are vaccinated.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- Vaccination of children age 1-6 years is now included in the protocol and validated by the Kinshasa Ethics Committee.
- Follow-up data on day 3 is being collected, however is incomplete at this time. Preliminary information is as follows:
    - Of 58 vaccinated on May 28, on day 3 of follow-up, 30 were seen, 7 reported adverse side effects.
    - Of 53 vaccinated on May 30, on day 3 of follow-up, 13 were seen, 6 reported adverse side effects (gastritis, fever, headache).
- Although MoHP announced that vaccination in Mbandaka had been completed, numbers for additional persons vaccinated continue to be reported. On 3 June, 10 additional persons were reported to have been vaccinated in Mbandaka.
- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus – Zaire Ebola virus (rVSV-ZEBOV) vaccine in Mbandaka on 21 May, and in Bikoro and Itipo on 28 May.
- Materials are being provided by UNICEF to those eligible for ring vaccination in line with protocols.

Therapeutics:

- There will be five (5) investigational therapeutics that will potentially be administered under compassionate use. There was an expert committee composed of international experts (including representatives from NIH, BARDA, CDC and FDA) and national experts (2 Congolese) that reviewed the compassionate use recommendations.
- WHO convened a working group of international and national experts (including representatives from NIH, BARDA and FDA) to design a randomized clinical trial to compare some of the investigational therapeutics. The design is currently under review.
- There continues to be laboratory support for therapeutics, diagnostics, and case management.
- Cold chain has been established for the investigational drugs.
- NIAID Vaccine Research Center (VRC) clinicians, who deployed to the DRC to provide technical advice to INRB staff on mAb114 administration, are in Kinshasa working with Embassy, CDC, WHO and MoHP to determine the best location for their training. The training was requested by MoHP and WHO. VRC staff will not be entering ETUs.

Research:

- The WHO R&D Blueprint and the DRC Institut National de Recherche Biomédicale (INRB) are convening a group of international and national experts (including representatives from NIH, CDC, FDA, ASPR and ASPR/BARDA) on June 6th to review the proposed research agenda and related research activities.

Communication & Social Mobilization

- The Government of the DRC had decreed free healthcare in all affected health areas on 16 May; subsequently, on 4 June, free care was declared in all 40 public health facilities in Mbandaka. The Minister of Health will preside over an official ceremony to hand over 65 tons of medicine to these health facilities during his trip to Mbandaka this week.
- On Saturday, 2 June, the MoHP, through its Provincial Division of Health of Kinshasa, with the support of the WHO, organized a day of sensitization in the health zones of the Nsele and Maluku, in Kinshasa.
    - These two sites are the main risk areas in the city of Kinshasa
    - The different ports and Ndjili airport located in the two HZs receive many travelers shuttling back and forth between the provinces of Kinshasa and Équateur.
- Consolidation of rumor banks/lists in all pillars (WASH, Case Management, etc.) is being conducted in collaboration with anthropologists; this information will become available soon.
- Relais communautaires (RECO)/CHWs were deployed to conduct active case finding of missing contacts.
- A hotline in Kinshasa was set up for questions on Ebola.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- U.S. Mission Nigeria, and Embassies Addis Ababa, Bamako, Dar es Salam, Kampala, Kigali, and Nairobi have issued Health Alerts to advise U.S. citizens of heightened screening at ports of entry due to the Ebola outbreak in the Democratic Republic of Congo.

Response & Coordination

- On 29 May 2018, the Minister of Health carried out a field visit to Itipo, one of the hotspots in Iboko HZ, to review ongoing response and provide support.
- UNOCHA and WHO are working with partners on the ground (OXFAM, MSF-Belgium, MSF-Switzerland, Actions against Hunger (ACF), Médecins du Monde (MDM) Spain, International Organization for Migrants (IOM), ALIMA, CDC, Pasteur Institute of Dakar, and others) to finalize the "4Ws" matrix (who, what, where and when) in order to streamline allocation of responsibilities and tasks, and ensure comprehensive coverage as well as avoid duplication.
- WHO is continuing to provide logistical support with the deployment of logisticians in the field.
- USAID has obligated $8 million dollars to support the joint GoDRC and WHO Strategic Response Plan to the outbreak (currently budgeted at $56.7 million). Interventions supported by USAID contribution ; in kind support for diagnostic testing & logistics and PPE; and short term support provided by USAID are detailed in a previous USG Sitrep #23, dated 1 June. Updates regarding USAID contributions include the following topics:
    - PPE: 320 PPE sets from FAO have arrived in ROC, ready for use as needed for either the Ministry of Livestock and Wildlife or Ministry of Health.
    - Short-term support: In addition to the robust health team on the ground, USAID has two physicians and one WASH expert supporting the response.
- WHO AFRO has provided a total of US$ 179 000 catalytic funds to six of the nine countries targeted for EVD preparedness.
- WHO has mobilized a total of US$ 1.55 million from the Contingency Fund for Emergencies to support preparedness and readiness interventions in the nine targeted countries.

WASH

- There were 4 IPC + WASH trainings conducted at health facilities.

Border Health (BH)

- **Countries Reported to Have Implemented Entry Screening (23)**

Angola	Gabon	Mozambique	Tanzania
Botswana	Gambia	Nigeria	Thailand
Cameroon	Ghana	Republic of Congo (Congo-R)*	Vietnam
Central African Republic	Kenya	Rwanda	Uganda
China	Malawi	Seychelles	Zambia
Ethiopia	Mali	South Sudan	

* Screening reported to occur for main ferry connection between Kinshasa and Brazzaville. There are no direct commercial passenger flights from Kinshasa to/from Brazzaville.

- In DRC, screening at the main entry points of travelers continue; on 3 June, 2,871 people were screened across the equipped points of entry, including 321 in Bikoro, 636 in Mbandaka, and 1914 in Kinshasa. Zero (0) alerts were reported.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- CDC/FELTP conducted site visits with Programme National de l'Hygiene aux Frontieres (PNHF) to points of entry (POE) in Kinshasa, including Ndjili International Airport- NIA (including the MONUSCO terminal), and the river crossings at Maluku, Kinkoli, and the Beach.
- Screening is underway at Kinshasa POEs, although a lack of training, essential screening tools, PPE, written standard operating procedures, and inconsistent temperature taking were noted at each.
- CDC/FELTP, PNHF, and partners are coordinating to enhance exit screening for international departures from Ndjili and to bolster entry screening at the domestic and MONUSCO terminals.
- The CDC Border Health Team attended the first meeting of the POE sub commission, headed by the Director of PNHF.
    - The sub commission was set up to improve the coordination of POE preparedness activities among the MOH and partners, as well as to improve the quality/utility of POE indicators presented at the Ebola response coordinating meetings.
    - Sub Commission supported use of modified travelers' health declaration form recommended by CDC BH Team.
    - Additional meeting planned to develop a CDC/FELTP-led "train the trainers" program to support POE screening.

Deployment & Logistics

- The GOARN partners (particularly MSF, UNICEF, IFRC, and WHO) continue to mobilize international technical and logistical support in response to the EVD outbreak. WHO is also working closely with the sister UN Agencies, partners and donors to ensure adequate support is provided to the response.
- On 4 June, additional CDC SMEs have been accepted by GOARN to provide support for epidemiology and surveillance activities with the Ebola response in DRC; deployment logistics are being worked out in collaboration with GOARN.
- As of 4 June, eight CDC staff are deployed to DRC, five to provide support to CDC-DRC country office and three under the GOARN auspices (Technical Advisor, and 2 Border Health). One Border Health consultant has returned. Additional CDC deployments include two persons as part of GOARN response: 1 person for EOC support (6 June), 1 person for Border Health (9 June).
- WHO is currently monitoring the safety of 162 deployed staff in DRC.
- On 1 June, the MoHP sent 40 new motorcycles to facilitate surveillance work in the field.
- Personal Protective Equipment (PPE) was distributed to two health centers and the reference hospital in Bikoro.

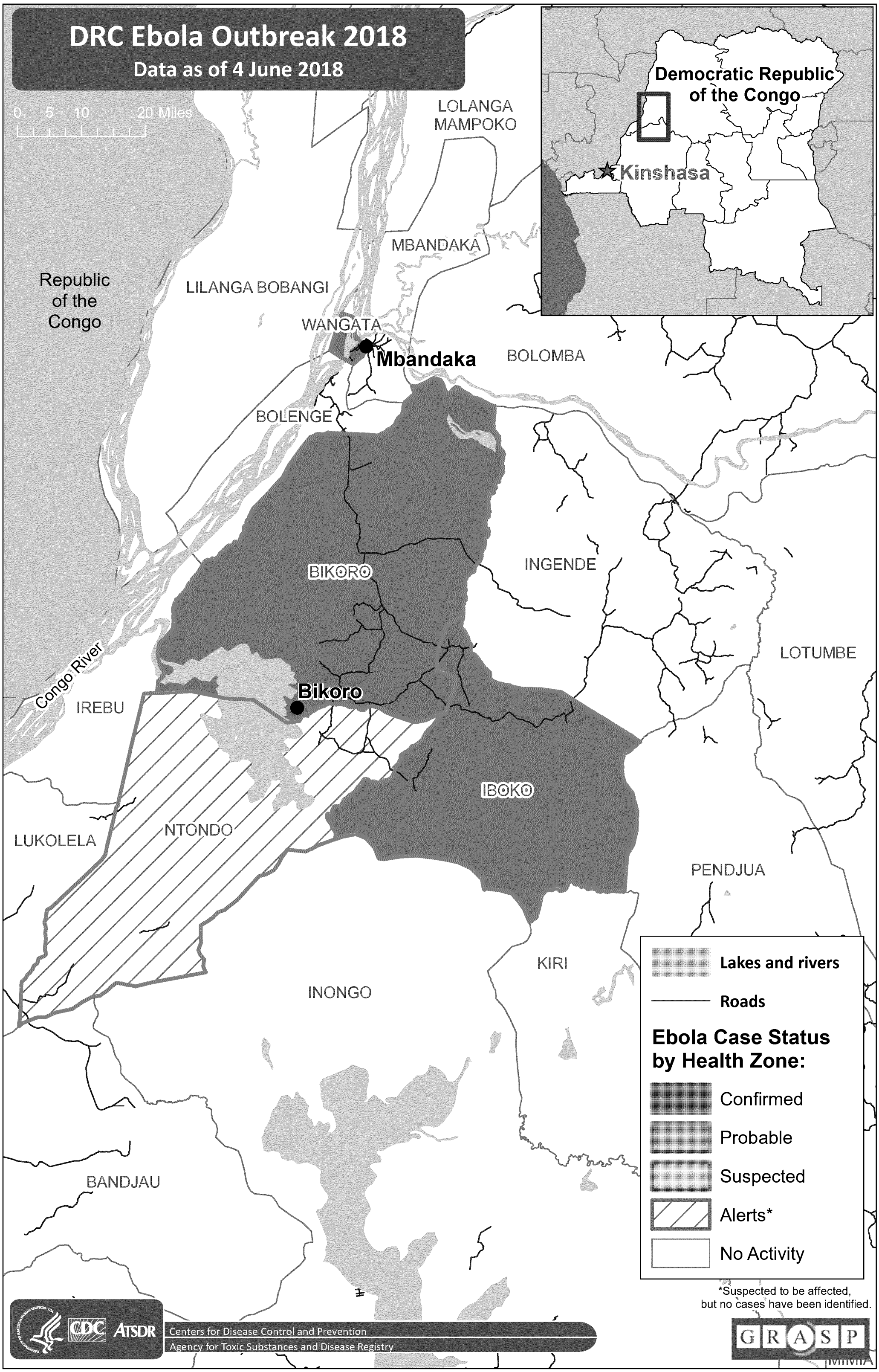
Challenges

- Resources for response personnel in the field is limited; efforts to mobilize additional resources are underway.
- The number of local doctors and nurses available to support the provision of health care is another limitation that affects the ability to rapidly scale up ETUs and provide safe clinical management that meets standards of care; preparation is needed to be able to deliver therapeutics.
- Challenges to contact tracing due to logistical issues, including communication, associated with heavily forested and remote areas continue to be addressed.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 4 June 2018



From: Arthur, Ray (CDC/CGH/DGHP) [rca8@cdc.gov]
Sent: 6/1/2018 1:40:19 PM
To: aaron.firoved@HQ.DHS.GOV; Adeniyi-Jones, Samuel (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b4d4fcfef92d4d08be98c52ea3445102-HHS-Samuel.]; (b)(6) @nsc.eop.gov; Alton, Jennifer (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fd8a0f207f3d44a983078c4999a56e79-HHS-Jennife]; andrew.p.hollands.civ@mail.mil; (b)(6) @nsc.eop.gov; beth.d.kennedy.ctr@mail.mil; Bright, Rick (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c3bec03ac81843dab3ad88c0dd5013c1-HHS-Rick.Br]; Paules, Catharine I (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7be5f15584944ca9a6c411751d7db6a8-HHS-cathari]; CDC IMS Ebola DRC [eocevent272@cdc.gov]; CDC NIOSH PMRD Lead Team [NIOSHOMSHRLeadTeam@cdc.gov]; Cho, David S (CBER) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d47af9d991af4c1fbf7cb4c1d287f83e-ChoD]; (b)(6) @omb.eop.gov; (b)(6) @omb.eop.gov; christopher.a.millard.civ@mail.mil; ckomich@usaid.gov; cleonardo@usaid.gov; Cox, Edward M [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=162e42f507494baca7b6b8299a7bbbbb-COXE]; david.m.mcadam.civ@mail.mil; dcarroll@usaid.gov (CDC usaid.gov) [dcarroll@usaid.gov]; dennis.w.bartow.civ@mail.mil; Disbrow, Gary (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e0265d217b2344c6bbbaad0cbb2f0c6a-HHS-Gary.Di]; DL.Africa@whmo.mil; DL.Resilience@whmo.mil; DL.WMD@whmo.mil; dtra.belvoir.pi.mbx.joint-ops-center@mail.mil; eric.e.kessler.mil@mail.mil; Garrett, Andrew (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6d44a01d87a54c38acaf829194b4bffa-HHS-Andrew.]; (b)(6) @ostp.eop.gov; glasserJL@state.gov; Gruber, Marion [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=019cd2669c7048f7a116d72b7682de44-gruber]; Haberer, Bethany (CDC usaid.gov) [bhaberer@usaid.gov]; Handzel, Thomas (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=24fe77e86c1243acbae17938c26d39d1-HHS-tnh7-cd]; haskellj@state.gov; hila.hanif.civ@mail.mil; ian.d.watson.civ@mail.mil; jdworken@usaid.gov; (b)(6) (b)(6) @ostp.eop.gov; jennifer.m.kishimori.mil@mail.mil; (b)(6) @nsc.eop.gov; john.j.trigilio.civ@mail.mil; Jones, Steven (CDC mail.mil) [steven.p.jones10.civ@mail.mil]; joseph.e.piansay.mil@mail.mil; (b)(6) @nsc.eop.gov; Kerr, Lawrence (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0920fe6d7b54496b84446fee6a21ddea-HHS-Lawrenc]; kimberly.a.lebutt.civ@mail.mil; Krause, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=00c6330fea0042fdb5571c3fdef792ed-krause]; Larsen, Joseph (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d01661f2f25e4d6797a6cdaedf2e8bc4-HHS-Joseph.]; Locus, Tiffany (OS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7bcc86804dc449c18c21be6469f0ee86-HHS-Tiffany]; (b)(6) @nsc.eop.gov; Mair, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=f4511bdad7564d7fac7eadc7961467ab-Michael.Mai]; MalloryJL@state.gov; mandi.tuttle.civ@mail.mil; Marston, Hilary D (NIH) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=87f32347b819459fb55d2b7e2bacc5eb-HHS-hilary.]; (b)(6) @omb.eop.gov; osd.pentagon.ousd-policy.list.hadr@mail.mil; Pandemic-Response-OES@state.gov; (b)(6) @nsc.eop.gov; philip.o.newton2.civ@mail.mil; (b)(6) @nsc.eop.gov; RBoyer@usaid.gov; (b)(6) @ovp.eop.gov; rgreene@usaid.gov; Scherf, Uwe [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b184b713fc4d4edc84d1aed078aafec7-UXS]; Schoenholz, Kendra (CDC usaid.gov) [kschoenholz@usaid.gov]; ScovitchJR@state.gov; SES-O_CMS@state.gov; spaige@usaid.gov; tobertgm@state.gov; Tocco, Christophe (CDC usaid.gov) [ctocco@usaid.gov]; (b)(6) @nsc.eop.gov; (b)(6) @omb.eop.gov
CC: Henao, Olga L (CDC) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ff5c6a49630e478c8f75c2a22cb73eb7-HHS-dot8-cd]; GDD-OUTBREAK (CDC) [GDDOUTBREAK@cdc.gov]
Subject: DRC Ebola USG Sitrep 23_ 1 June 2018
Attachments: DRC Ebola USG sitrep 23_1 June 2018.docx

Dear Colleagues,

The subject SitRep is attached. CDC greatly appreciates the information that many of your institutions have contributed.

Thanks.
Ray

Ray R. Arthur, PhD
Lead, Global Disease Detection Operations Center
Emergency Response and Recovery Branch

Division of Global Health Protection
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Democratic Republic of Congo (DRC) Ebola

USG SITUATION REPORT

1 JUNE-2018

SITREP #23

INTERNAL USG USE ONLY

50	37	13	0	25	506 / 880 (58 %)
Total Cases	Confirmed Cases	Probable Cases	Suspected Cases	**Deaths**	**Contacts** Followed/Total (%)

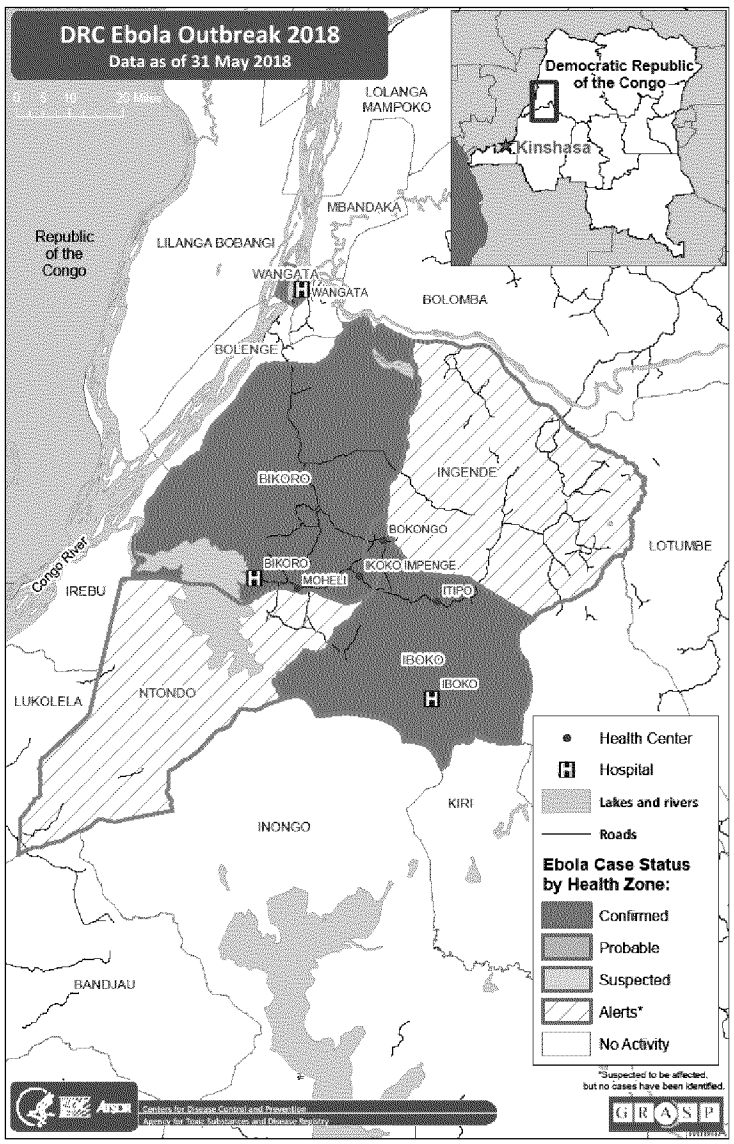
Provisional Case Counts - Data as of 31 May 2018 in DRC. Cases will be reclassified and possibly removed as data validation continues. Numbers shown in red have changed over past 24 hours; details of changes are shown in the table under Epi/Surveillance section.

Situation Overview

On 8 May 2018, the Ministry of Health and Population (MoHP) of Democratic Republic of Congo (DRC) confirmed an outbreak of Ebola Virus Disease (EVD) in Équateur Province in Northwest DRC.

The three health zones reporting confirmed cases remain unchanged: Bikoro, Iboko, and Wangata (in the city of Mbandaka). Surveillance for cases, contact tracing and investigations continue in Mbandaka and with renewed focus on Iboko and Bikoro. Efforts to improve contact tracing and case finding continue.

On 21 May 2018, the MoHP launched the first vaccinations against Ebola Virus Disease in Mbandaka. This is the first time in the history of the Democratic Republic of Congo that vaccination is an integral part of the government's response plan to respond to an Ebola outbreak.



Double click to enlarge map

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Epi/Surveillance

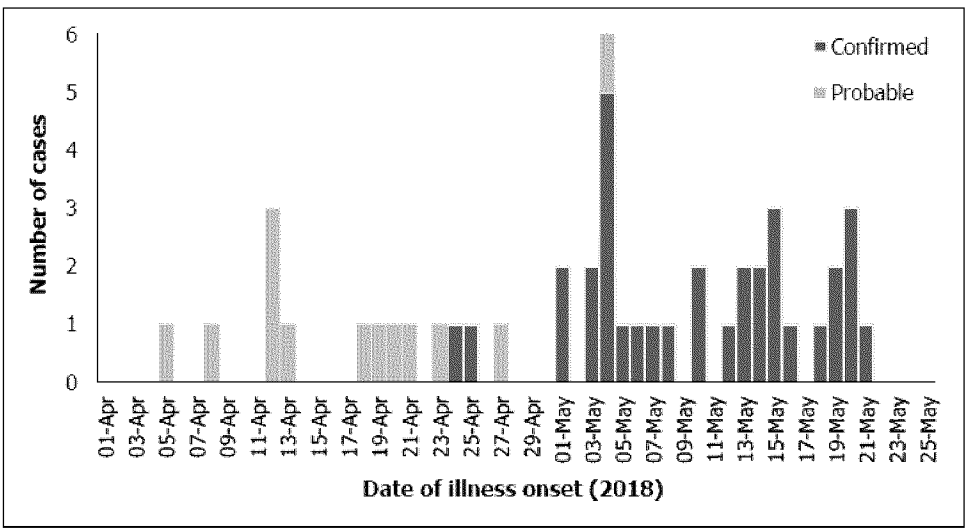
Health Zones (HZ)	Cases				Deaths	Contacts		
	Confirmed	Probable	Suspected	Total	Total	# Followed	Total	% Followed
Bikoro	10	11	0	21 (+0)	17 (+1)	169 (+50)	223 (+102)	76 (-23)
Iboko	23 (+1)	2	0 (-1) (-2)	25 (-2)	5 (-1)	199 (-125)	466 (+21)	43 (-30)
Wangata	4	0	0 (-1)	4 (-1)	3	138 (+73)	191 (+12)	72 (+36)
Ntondo	0	0	0	0	0	0	0	0
Total	**37** (+1)	**13**	**0** (-1) (-3)	**50** (-3)	**25** (+0)	**506** (-2)	**880** (+135)	**58** (-11)

Provisional Case Counts – DRC MoHP Press Release dated 31 May 2018. Cases will be reclassified and possibly removed as data validation continues.
Changes (+/-) reflects changes over past 24 hours.

Overall:

- No new suspected cases were reported in the past day; three (3) suspected cases tested negative.
- As of 31 May, there were a total of 50 cases (37 confirmed cases, 13 probable, 0 suspected), distributed in the following HZs: Bikoro (21 cases), Iboko (25 cases), and Wangata (4 cases).
- The total number of deaths among the total cases remained 25.
- The percentage of the total number of identified contacts being followed has decreased from 68% to 58%.
    - On 30 May, the low coverage in Mbandaka was explained by communication difficulties slowing the submission of data to Kinshasa.
    - On 31 May, the low coverage in Iboko was explained by the lack of cellphone or satellite phone coverage and transportation challenges due to rain.
    - Meanwhile, the registration of contacts in Itipo has been reported to have improved.
- An epi curve with the suspected cases omitted was published in the latest [HYPERLINK "http://apps.who.int/iris/bitstream/handle/10665/272695/SITREP-EVD-DRC-20180529-eng.pdf?sequence=1&isAllowed=y"]

Figure 1. Epidemic curve for Ebola virus disease outbreak in Equateur Province, Democratic Republic of the Congo, 25 May 2018



Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Bikoro HZ:

- One (1) death among confirmed cases was added after a review of the database.

Iboko HZ:

- One (1) suspected case was reclassified as a confirmed case.
- Two (2) suspected cases tested negative.
- One (1) death among confirmed cases was deleted after a review of the database.

Wangata HZ (in city of Mbandaka):

- One (1) suspected cases tested negative

Laboratory

- A National Laboratory Strategy has been developed, focusing on GeneXpert for confirmatory testing in key sites such as Ebola Treatment Centers (ETC) and GeneXpert is now fully functional in Bikoro Health Zone.

Case Management

- The number of patients in treatment facilities and their distribution is as follows:

Treatment Facility	# Patients
Mbandaka ETU	0
Bikoro ETU	13 (+1)
Iboko transit center	3
Itipo transit center	4
Moheli transit center	0
Total	**20 (+1)**

Changes (+/-) reflects net changes over past 24 hours.

- One HCW was admitted to the Bikoro ETU as a suspected case after being transferred from Itipo on 30 May; this patient has since tested negative.
- The commission continues to provide support to families of victims, case contacts, patients in ETUs, and those who have been discharged from ETUs.

Vaccine/Research

Ring Vaccination:

- The MoHP launched the use of ring vaccination with the investigational recombinant vesicular stomatitis virus – Zaire Ebola virus (rVSV-ZEBOV) vaccine in Mbandaka on 21 May, and in Bikoro and Itipo on 28 May.
- Vaccinations in Iboko village have yet to start.
- Following MoHP awareness sessions for tolekistes and motorcycle taxis, all drivers who have been in contact with confirmed cases of Ebola have reportedly voluntarily registered to benefit from vaccination.
- According to MoHP, as of 31 May, a total of 682 people have been vaccinated, including 499 in Mbandaka, 113 in Bikoro and 70 in Itipo (within Iboko HZ). The table below shows vaccinations of both first responders and contacts.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Ebola Vaccine - Number Vaccinated, DRC, 2018				
Location	**Mbandaka**	**Bikoro**	**Itipo**	**All**
Date	**#**	**#**	**#**	
21-May	**33**			
22-May	**0**			
23-May	**40**			
24-May	**81**			
25-May	**60**			
26-May	**104**			
27-May	**50**			
28-May	**58**	**20**	**16**	
29-May	**18**	**54**	**27**	
30-May	**55**	**39**	**27**	
Total	**499**	**113**	**70**	**682**

Vaccination (Other):

- CDC is coordinating with ASPR and BARDA to develop a white paper regarding considerations for domestic use of the EBOV vaccine in U.S. healthcare workers.

Therapeutics:

- At the request of the DRC MoHP, NIAID's Vaccine Research Center shipped the first 10 treatment courses (out of 100) of the investigational treatment mAb114 to their co-investigators at the INRB in Kinshasa, confirmed received 5/28. The DRC plans to use mAb114 for the treatment of EVD (specific protocol design elements to be determined).

Communication & Social Mobilization

- As of 30 May, the MoHP communications team has sensitized over 200 tolekistes (bicyclists) and motorcycle taxi drivers in Mbandaka City regarding precautionary measures to protect against Ebola virus disease. This priority target audience represent the means of transport used by the population in Mbandaka. Ill persons are often carried by these tolekistes or motorbike taxis to the nearest health center, constituting risk of exposure to the drivers as well as to passengers. Patients who have left the treatment center have been transported with their families by bikes taxis. Subsequent to the awareness sessions, the MoHP team has since identified five drivers who had been in contact with confirmed cases and are being tracked by the monitoring team.
- The commission continues to brief communities, including marginalized populations such as pygmies, churches, and traditional healers, to encourage people to seek appropriate care.
- Radio messages in French, Lingala, and Ntomba were finalized.
- WHO suggested strengthening communication efforts in Itipo to address resistance.
- Several schools in the Iboko Health Area have decided to suspend school activities; MoHP teams in charge of psychosocial monitoring have organized psycho-educational sessions in primary schools in the locality as well as meetings with teachers and parents.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Response & Coordination

- The Minister of Health visited the National Assembly 30 May to inform the deputies about the developments with the EVD outbreak.
- MoHP is working in collaboration with CDC EOC consultant as well as WHO Strategic Health Operations Center (SHOC) consultant to optimize organization of DRC EOC using the Incident Management System (IMS).
- Confirmation was received from field that INRB has received PPE and supplies from CDC.
- USAID has mobilized and obligated $8 million dollars to support the joint Government of DRC and World Health Organization (WHO) Strategic Response Plan to the outbreak (currently budgeted at $56.7 million). Interventions supported by USAID contribution include:
    - $5.3 million to be implemented by WHO for activities related to laboratory confirmation; surveillance, diagnosis, and contact tracing; case management; point-of-entry screening; and operations support, including the air-bridge to the region.
    - $2 million to be implemented by UNICEF for activities related to water, sanitation and hygiene (WASH), including infection prevention and control; and risk communication.
    - $700 thousand to be implemented by International Federation of Red Cross Red Crescent Societies (IFRC) for activities related to infection prevention and control; risk communication; safe and dignified burials; and community engagement.
- In-kind support for the following:
    - Diagnostic Testing and Logistics: USAID's project, PREDICT 2 has provided support including genetic analysis of Ebola virus and logistic support for the Ministry of Health's National Reference Lab. This includes lab consumables (test tubes, gloves, reagents), as well two mobile laboratories for the remote areas. PREDICT is also storing vaccines in their -80° Celsius freezer located at the national research lab.
    - Personal Protective Equipment (PPE): To date, USAID has mobilized PPE to support the EVD response from three implementing partners: Food and Agriculture Organization (FAO), PREDICT and WHO. USAID's partners have supplied over 18,000 PPE in addition to universal protection items, disinfectants, and support materials. This represents over two months of PPE needs requested by WHO and Government of DRC. In the Republic of Congo (ROC), which shares a border with DRC, the Ministry of Livestock and Wildlife requested FAO's participation in the multi-UN agency response in the context of preparedness for Ebola. 320 PPE sets from FAO will be sent to ROC, to be ready for use as needed for either the Ministry of Livestock and Wildlife or Ministry of Health.
    - Short-term support: In addition to the robust health team on the ground, USAID has sent two health specialists with previous Ebola and WASH specialties with an additional person to arrive shortly.

WASH

- The commission continues to provide safe burials and services to disinfect homes, health facilities, and other structures, and to distribute WASH-related supplies such as chlorine and hand washing stations in the affected areas.
- It was reported that children in Ikoko are no longer attending school because of rumors that the chlorinated water used for hand-washing in the schools are transmitting Ebola. Psychosocial experts are working with parents to dispel the rumors. In Bikoro, 30 teachers were briefed on Ebola transmission and prevention and trained to prepare chlorine solution.
- The commission is organizing a training for HCWs after an assessment showed low adherence to health care waste management best practices.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

Border Health (BH)

- **Countries Reported to Have Implemented Entry Screening (22)**

Angola	Gabon	Mozambique	Thailand
Botswana	Gambia	Nigeria	Vietnam
Cameroon	Ghana	Rwanda	Uganda
Central African Republic	Kenya	Seychelles	Zambia
China	Malawi	South Sudan	
Ethiopia	Mali	Tanzania	

- As of 30 May, incoming passenger health alert messages are being displayed on CDC operated monitors located at 13/13 POEs. CBP has received the incoming passenger monitor message and is in process for displaying on CBP operated monitors at airports with inbound international arrivals, including pre-clearance ports.
- CDC updated the Travel Notice to include a link to a map of affected areas in DRC: https://wwwnc.cdc.gov/travel/notices/watch/ebola-democratic-republic-of-the-congo
- CDC received an email inquiry from Samaritan's Purse (SP) about current movement and monitoring recommendations for HCW responders in anticipation of potential involvement with the response in DRC.
    - SP has offered ETU assistance in DRC but WHO has not responded to the offer yet so no current HCW deployments planned.
    - Considering sending a 2-3 person advance team to DRC in the next week to scope the situation.
    - Advised that monitoring recommendations are located in the Travel Health Notice and that self-monitoring for travelers from DRC, including responders, is currently recommended. Employers may also choose to utilize their own internal process/procedures for monitoring of returning staff but that a national monitoring system has not otherwise been implemented.
    - CDC offered to have call with SP POC to discuss further.
- Three (3) CDC Border Health team members deployed to DRC under GOARN, met with DRC MoHP Border Health Department Director (PHNF):
    - Discussed screening measures in place in Kinshasa at N'djili International Airport, and other Kinshasa priority screening locations.
    - MoHP and WHO requested the CDC team to focus their assistance on POEs in Kinshasa.
    - MoHP feels current human capital resources are sufficient for screening, but have severe shortages of equipment (PPE, gloves, thermoflashes).
    - Multiple other locations in DRC being evaluated by WHO and MoHP for potential screening activities/prioritization - vary in type and include markets, bus stations, other gathering locations, etc. in addition to what is considered a typical POE.
    - PHNF Director assigned a focal point who will accompany the Border Health team to visit priority POEs in Kinshasa.
- CDC Border Health team also visited N'djili International Airport on 31 May – initial report
    - Screening set up for domestic arrivals – talked through process (multiple points for temperature taking with handheld or thermal scanning after arrival – health questionnaire administered if fever observed with referral for further evaluation if indicated) but unable to observe as no domestic flights arriving during visit.
    - Thermal camera scanning only currently being used for international departures.
    - Team will revisit airport when domestic arrivals are scheduled to observe screening in real-time.
    - Plan is to evaluate, identify gaps, provide recommendations, assist with implementing recommendations/identifying resource needs.
- Planning visit to 1 – 2 other Kinshasa POEs depending on transportation availability on 1 June.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

- CDC Border Health team discussed implementing a train-the-trainer program with the FELTP Resident Advisor, focusing on POE and population connectivity and cross-border/cross-community movement and mapping techniques.
- Working with team in DRC to identify locations and map POEs and other sites where screening or monitoring activities have already been implemented or are scheduled to be implemented.
- In DRC, screening at the main entry points of travelers continue; as of 31 May, a cumulative total of 10,627 people have been screened across the equipped points of entry in Bikoro, Mbandaka, and Kinshasa.

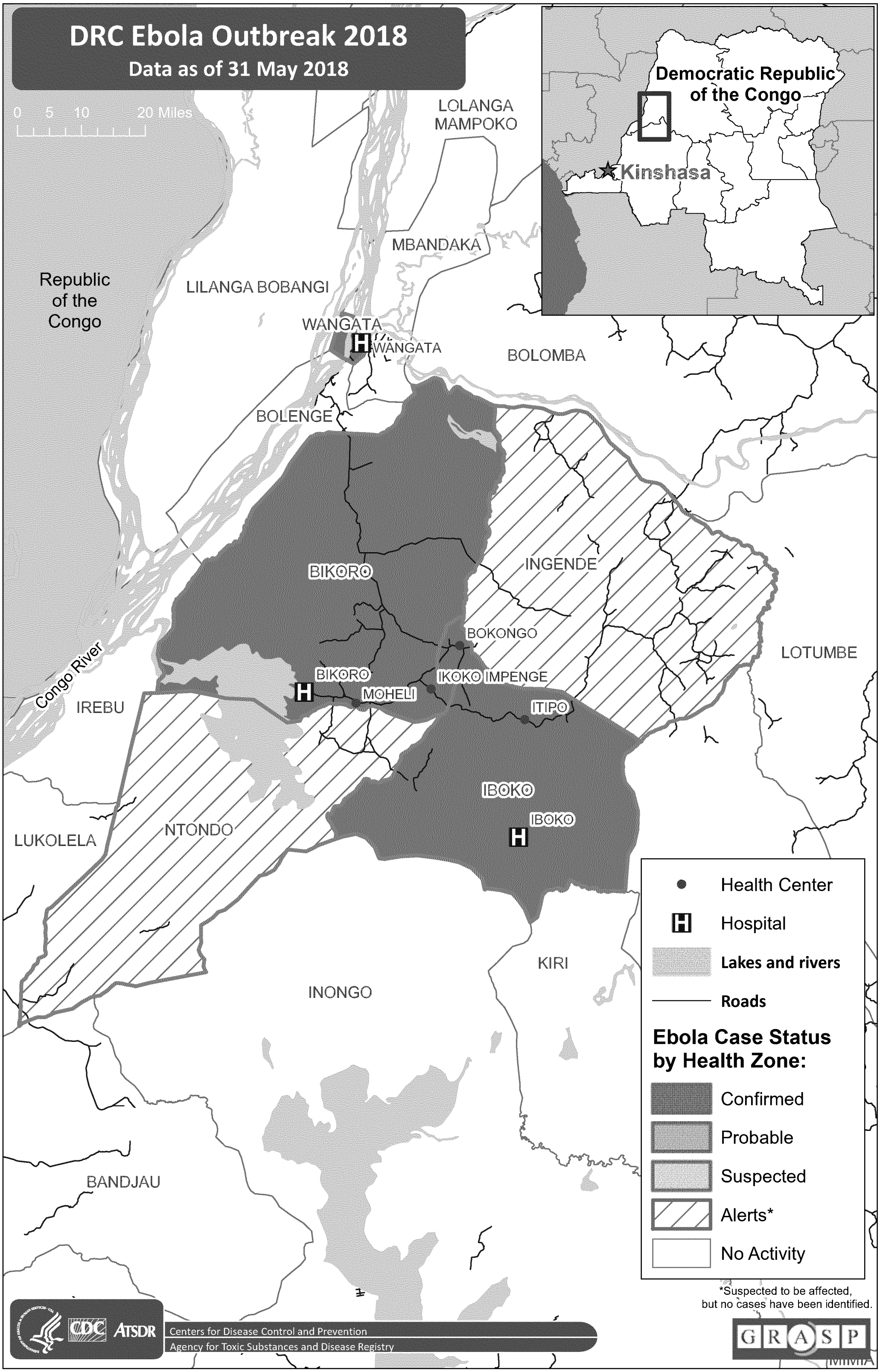
Deployment & Logistics

- CDC has staffed five of the thirteen GOARN deployments to the field thus far. Seven (7) of the 25 CDC offers submitted for candidates to join GOARN response to support Ebola outbreak in DRC has been accepted. GOARN is anticipating deployments to continue for at least another two months depending upon developments of the outbreak in near future.
- As of 31 May, eight CDC staff are deployed to DRC, three to provide support to CDC-DRC country office and five under the GOARN auspices (Technical Advisor, EOC and 3 Border Health).
- Additional CDC deployments include 2 persons to support CDC-DRC (tentative departures between 2-3 June), and two persons as part of GOARN response: 1 person for EOC support (2 June), 1 person for border health (9 June).
- NIAID will deploy 2 persons to Kinshasa to train INRB staff on mAb114 administration and handling.
- Lodging and logistics in Bikoro and Iboko HZs for response personnel remains limited.
- MONUSCO is setting tents for accommodation of responders in Iboko as a remedy to address the acute shortage.
- For safety and security purposes, WHO is tracking 159 people deployed for the Ebola response in DRC.

Challenges

- Resources for response personnel in the field is limited; efforts to mobilize additional resources are underway.
- The number of local doctors and nurses available to support the provision of health care is another limitation that affects the ability to rapidly scale up ETUs and provide safe clinical management that meets standards of care; preparation is needed to be able to deliver therapeutics.

Sources: CDC, DRC MoHP, GOARN, NIAID, NBIC, UNICEF, USAID, US Department of State, WHO

DRC Ebola Outbreak 2018

Data as of 31 May 2018