From: [redacted]
To: "cchrisman@usaid.gov" <cchrisman@usaid.gov>, Dennis Carroll <dcarroll@usaid.gov>, Peter Daszak <daszak@ecohealthalliance.org>, Jonna Mazet <jkmazet@ucdavis.edu>, Samtha Maher <maher@ecohealthalliance.org>, Eddy Rubin <erubin@metabiota.com>, "nwolfe@metabiota.com" <nwolfe@metabiota.com>
Subject: Draft BCA draft meeting
Sent: Thu, 15 Aug 2019 21:09:02 +0000
21 Aug Advisory panel meeting draft agenda.docx

For our discussion for GVP BCA draft meeting agenda.

[redacted]

GVP Benefit-Cost Analysis Advisory Panel Meeting

Berkeley, CA

Agenda

Tuesday 20 August

6:30 pm: dinner, Berkeley (location to be confirmed)

Wednesday 21 August

Meeting location:
UC Berkeley School of Public Health, Kwan Room
Berkeley Way West 2121 Berkeley Way, Berkeley, CA.

9:30am – 10am	Overview of progress to date and key discussion points for this meeting
10am - 10:30am	Update on conceptual framework
10:30 - 11:15am	Update on modeling methodology
11:15am - 12pm	Product development research: initial data
12pm - 12:30pm	Break - Lunch delivered
12:30pm - 1pm	Update on economic modeling
1pm - 2pm	Open questions • Parameterizing GVP improvement ○ Lessons/data from PREDICT • Testing/quantifying potential GVP impacts on spillover reduction
2pm - 2:30pm	Next steps and timeline updates
2:30pm	Meeting adjourns

Participants

BCA project team	Advisors
Dean Jamison	Jonna Mazet
Nita Madhav	Dennis Carroll (dial-in)
Nicole Stephenson	Cara Chrisman (dial-in)
Ben Oppenheim	Stephen Morse
Jaclyn Guerrero (dial-in)	Eddy Rubin
Stef Bertozzi	
Paola Gadsen (dial-in)	

From: Tracey Goldstein <tgoldstein@ucdavis.edu>
Sent: Tue, 20 Aug 2019 13:43:18 -0700
Subject: External partners for Bali
To: Andrew Clements <aclements@usaid.gov>, Alisa Pereira <apereira@usaid.gov>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, William Karesh <Karesh@ecohealthalliance.org>, David Wolking <djwolking@ucdavis.edu>

Hi Andrew,

In addition to USAID staff already invited, below is the list we came up with to also be invited to Bali based on previous attendance. Will you take a look and see if you agree and have any additions?

Thank you! Tracey

Marilyn Crane	USAID
Ricardo Echalar	USAID
Wantanee Kalpravidh	FAO
Sophie Von Dobschuetz	FAO
Yilma Makonnen	FAO
John Paul Clark	World Bank
Katie Pelican	OHW
Rob Salerno	P&R
Contact?	INDOHOUN
Casey Barton Behravesh	CDC
Elizabeth Mumford	WHO
Zhang Wenquing	WHO

--

Tracey Goldstein, PhD
One Health Institute
School of Veterinary Medicine
University of California
Davis, CA 95616
Phone: (530) 752-0412
Fax: (530) 752-3318
E-mail: tgoldstein@ucdavis.edu

From: Andrew Clements <aclements@usaid.gov>
Sent: Wed, 21 Aug 2019 18:35:07 +0200
Subject: Re: External partners for Bali
To: Tracey Goldstein <tgoldstein@ucdavis.edu>
Cc: Alisa Pereira <apereira@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, William Karesh <Karesh@ecohealthalliance.org>, David Wolking <djwolking@ucdavis.edu>

Thanks, Tracey.

I wouldn't invite Wenqing Zhang since she hasn't been too involved or Rob Salerno since P&R has ended. I would include Filip Claes from FAO/Bangkok. The others look good.

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

On Tue, Aug 20, 2019 at 10:43 PM Tracey Goldstein <tgoldstein@ucdavis.edu> wrote:

> Hi Andrew,
>
> In addition to USAID staff already invited, below is the list we came up with to also be invited to Bali based on previous attendance. Will you take a look and see if you agree and have any additions?
>
> Thank you! Tracey

Marilyn Crane	USAID
Ricardo Echalar	USAID
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Yilma Makonnen	FAO
John Paul Clark	World Bank
Katie Pelican	OHW
Rob Salerno	P&R
Contact?	INDOHOUN
Casey Barton Behravesh	CDC
Elizabeth Mumford	WHO
Zhang Wenquing	WHO

--

Tracey Goldstein, PhD
One Health Institute
School of Veterinary Medicine
University of California
Davis, CA 95616
Phone: (530) 752-0412
Fax: (530) 752-3318
E-mail: tgoldstein@ucdavis.edu

From: Andrew Clements <aclements@usaid.gov>
Sent: Fri, 30 Aug 2019 14:18:55 -0700
Subject: Re: Change to Approved Group ITA: Bali All-Country Meeting
To: Katherine Leasure <kaleasure@ucdavis.edu>
Cc: PREDICTMGT <predictmgt@usaid.gov>, Predict inbox <predict@ucdavis.edu>, Jonna Mazet <Jkmazet@ucdavis.edu>

Approved.

Andrew P. Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On Aug 30, 2019, at 6:17 PM, Katherine Leasure <kaleasure@ucdavis.edu> wrote:

Hi Andrew. Please find below changes to the group ITA submitted for travel to Bali for the PREDICT All-Country Meeting. Please let me know if you have any questions. Thanks!

PARTICIPANT CHANGE	NAME	DEPARTURE LOCATION	AIRFARE COST
ADD	Subhash Morzaria	Algarve, Portugal	$5,800*
CANCEL	Aiah Gbakima	Freetown, Sierra Leone	$2,700
CANCEL	Rudovick Kazwala	Dar es Salaam, Tanzania	$2,800
CANCEL	Alpha Camara	Conakry, Guinea	$2,500

**business class required due to medical need*

CHANGE TO TRIP DETAILS (additional non-PREDICT travel):
Nistara Randhawa (UC Davis) will travel from San Francisco, California, USA to Delhi, India from September 4-12, 2019 for non-PREDICT travel. She will travel from Delhi, India to Bali, Indonesia from September 13-21, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 18-19). She will return from Bali to Davis, California, USA.

Pranav Pandit (UC Davis) will travel from Davis, California, USA to Bali, Indonesia from September 13-21, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 18-20). He will travel from Bali to Mumbai, India from September 21 to October 7, 2019 for non-PREDICT travel. He will return from Mumbai to Davis, California, USA.

Jaber Belkhiria (UC Davis) will travel from Tunis, Tunisia to Bali, Indonesia from September 7-19, 2019 for non-PREDICT travel (September 8-13) and the PREDICT-2 All-Country Meeting. He will return from Bali to Tunis, Tunisia.

Zoe Grange (UC Davis) will travel from Dunblane, United Kingdom to Bali, Indonesia from September 11-19, 2019 for non-PREDICT travel (September 12-13), and the PREDICT-2 All-Country Meeting. She will return from Bali to Dunblane, United Kingdom.

Kevin Gonzales (UC Davis) will travel from Los Angeles, California, USA to Bali, Indonesia from September 13-29, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 18-28). He will return from Hong Kong to Los Angeles, California, USA.

Alexandre Tremeau-Bravard (UC Davis) will travel from Davis, California, USA to Bali, Indonesia from September 13-22, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 18-20). She will return from Bali to Davis, California, USA.

Brooke Genovese (UC Davis) will travel from Davis, California, USA to Bali, Indonesia from September 10-19, 2019 for non-PREDICT travel (September 12-13), and the PREDICT-2 All-Country Meeting. She will return from Bali to Davis, California, USA.

Eunah Cho (UC Davis) will travel from Davis, California, USA to Bali, Indonesia from September 10-19, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 12-13). She will return from Bali to Davis, California, USA.

Jennifer Lane (UC Davis) will travel from Davis, California, USA to Bali, Indonesia from September 12-20, 2019 for the PREDICT-2 All-Country Meeting and non-PREDICT travel (September 18-19). She will return from Bali to Davis, California, USA.

transportation costs will not exceed that of ticket to Bali for meeting dates.

--
Katherine Leasure
HR/Payroll/Financial Assistant
One Health Institute
530-752-7526

--

From: Cara Chrisman <cchrisman@usaid.gov>
Sent: Wed, 25 Sep 2019 16:45:32 -0400
Subject: Reminder: GVP Call Tomorrow + Agenda
To: Jonna Mazet <jkmazet@ucdavis.edu>, [redacted], Peter Daszak <daszak@ecohealthalliance.org>, Samantha Maher <maher@ecohealthalliance.org>, Nathan Wolfe <nwolfe@metabiota.com>, Eddy Rubin <erubin@metabiota.com>
Cc: Dennis Carroll <[redacted]>

Hi All,

Looking forward to speaking with you tomorrow, the agenda is pasted below. I believe that we have a quorum, but if you are unable to make it, please let me know.

Best,
Cara

Agenda
1. Status of 501c3
2. Planning for October 21 deep dive - agenda, logistics, etc.
3. Follow up on economic analysis
4. Lancet commentary
5. Interest from the Hill
6. TVPP Update
7. AOB (upcoming presentations?)

Cara J. Chrisman, PhD
Senior Infectious Diseases Technical Advisor
U.S. Agency for International Development (USAID) Contractor
Bureau for Global Health, Office of Infectious Disease, Emerging Threats Division
2100 Crystal Drive, CP3-8091A, Arlington, VA 22202
Desk: (571) 551-7413

Cell: [redacted]
E-mail: cchrisman@usaid.gov

GHSI-III - Social Solutions International, Inc. prime contractor

From: "Goodtree, Hannah" <HGoodtree@nas.edu>
To: Jonna Mazet <jkmazet@ucdavis.edu>, David Rizzo <dmrizzo@ucdavis.edu>, "'Miller, Sally'" <miller.769@osu.edu>, "'daszak@ecohealthalliance.org'" <daszak@ecohealthalliance.org>, "'kevin.anderson@dhs.gov'" <kevin.anderson@dhs.gov>, "'Hermsen, Elizabeth D'" <elizabeth.hermsen@merck.com>, "'mewilson@hsph.harvard.edu'" <mewilson@hsph.harvard.edu>, [redacted] "'mary_wilson@harvard.edu'" <mary_wilson@harvard.edu>, "'Hughes, James M'" <jmhughe@emory.edu>, "'Barton Behravesh, Casey (CDC/OID/NCEZID)'" <dlx9@cdc.gov>, "mlichtve@tulane.edu" <mlichtve@tulane.edu>, "'MUMFORD, Elizabeth'" [redacted] 'Amy Pruden'" <apruden@vt.edu>, "'Rushton, Jonathan'" <J.Rushton@liverpool.ac.uk>, [redacted] 'Mary Radford' <maradford@ucdavis.edu>, "'andre@ecohealthalliance.org'" <andre@ecohealthalliance.org>, "Chukwurah, Chinenye" <CChukwurah@nas.edu>
Subject: OHAC Call #20
Sent: Thu, 21 Nov 2019 19:50:16 +0000

Hello OHAC members,

Please join us for call #20 on January 21st, 2020 at 2 PM ET via Zoom. Please let me know if I can be of any assistance.

Thank you,
Hannah Goodtree

Instructions for accessing the virtual meeting:* Please navigate to: [redacted]
* If prompted, download and run ZOOM
* Enter Name
* Click Join
* Once the ZOOM program begins, you will be asked how you would like to connect with audio. Please choose to have the program call you directly- this will link your audio line to your name on the screen sharing page, which will make it much easier for me to keep track of your audio levels.
* IF YOU WOULD LIKE TO JOIN SIMPLY BY TELEPHONE, PLEASE DIAL REDACTED AND USE MEETING ID # REDACTED
* For international numbers, please visit: [redacted]

NOTICE: The Zoom service allows audio and any materials exchanged or viewed during the session to be recorded and shared. Please be aware that by participating in this activity, you consent to your voice, likeness, and any materials you provide, being recorded for use and dissemination, without payment of any compensation for such use, in any language, format, or media now known or later devised, and you release the National Academies of Sciences, Engineering, and Medicine from any and all claims, liability, or damages arising from any such use. The Academies will proceed in reliance upon such consent and release. If you do not consent to the foregoing, please do not join the session.

From: REDACTED
To: "Morens, David (NIH/NIAID) [E]" <dmorens@niaid.nih.gov>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>
Subject: Re: Virus Spillover Risk Assessment Draft Manuscript
Sent: Thu, 16 Jan 2020 13:50:05 +0000

Hi David,

I hope you had an enjoyable extended vacation and are making progress on your emails. Thank you for your suggestion, I am in the process of submitting the manuscript to The Lancet and will include a couple sentences about the relevance of our findings and tool with regards to the Wuhan coronavirus outbreak.

Kind regards,

REDACTED

Project Scientist, PREDICT Project of USAID
Postdoctoral Researcher in Disease Ecology
One Health Institute
School of Veterinary Medicine
University of California Davis
1089 Veterinary Medicine Drive
Davis, CA 95616, USA

Mobile: REDACTED

From: "Morens, David (NIH/NIAID) [E]" <dmorens@niaid.nih.gov>
Date: Monday, January 13, 2020 at 3:05 PM
To: REDACTED
Cc: Jonna Mazet <jkmazet@ucdavis.edu>
Subject: RE: Virus Spillover Risk Assessment Draft Manuscript

REDACTED sorry for my delay in further feedback, I took an unusually long holiday vacation and now trying to catch up with – literally – tens of thousands of emails.

The paper reads really well. Figure 1 is fascinating and thought-provoking, and not exactly what I would have predicting vis a vis a few of the variables.

Not sure where you guys are with the ms., but in view of the new Wuhan coronavirus outbreak it might be topical to add a sentence or two on how this emergence fits in with the predicted risk.

David

David M. Morens, M.D.
CAPT, United States Public Health Service
Senior Advisor to the Director
Office of the Director
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Building 31, Room 7A-03
31 Center Drive, MSC 2520

Bethesda, MD 20892-2520
☎ 301 496 2263 (assistants: Kimberly Barasch; Whitney Robinson)
301 496 4409
dm270q@nih.gov

From: Morens, David (NIH/NIAID) [E]
Sent: Friday, December 13, 2019 9:05 AM
To: REDACTED
Cc: Jonna Mazet <jkmazet@ucdavis.edu>
Subject: RE: Virus Spillover Risk Assessment Draft Manuscript

REDACTED thanks for sending, on a first glance it looks pretty impressive! I'll take a look more carefully as soon as I get a chance.

David

David M. Morens, M.D.
CAPT, United States Public Health Service
Senior Advisor to the Director
Office of the Director
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Building 31, Room 7A-03
31 Center Drive, MSC 2520
Bethesda, MD 20892-2520
☎ 301 496 2263 (assistants: Kimberly Barasch; Whitney Robinson)
301 496 4409
dm270q@nih.gov

From: REDACTED
Sent: Friday, December 13, 2019 5:01 AM
To: Morens, David (NIH/NIAID) [E] <dmorens@niaid.nih.gov>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>
Subject: Virus Spillover Risk Assessment Draft Manuscript

Dear David,

We are delighted to attach a draft version of the manuscript and supplementary material to be submitted for peer review. Please let us know if you have any questions, issues or concerns about the content. We would like to keep the content of this manuscript and location of the associated website confidential until publication, please do not distribute.

Thank you again for your contribution.

Kind regards,

REDACTED and Jonna

Prof. Jonna AK Mazet
Professor of Epidemiology & Disease Ecology
Executive Director
jkmazet@ucdavis.edu

REDACTED
Project Scientist, PREDICT USAID
Postdoctoral Researcher in Disease Ecology
REDACTED

Sent: Thu, 26 Mar 2020 15:01:45 -0700
Subject: Thank you & decent scientific reporter
From: Jonna Mazet <jkmazet@ucdavis.edu>
To: [redacted]
Cc: Peter Daszak <daszak@ecohealthalliance.org>, Hongying Li <li@ecohealthalliance.org>

Dear Zheng-Li,
Just a note to thank you for your amazing work and service to the world. We are all honored to have you as a colleague and collaborator, and I hope your days there are okay and you are staying well.

I know you are swamped with reporter requests and all of the other things related to the pandemic. If you are making choices about which reporter requests to respond to, I just wanted to give thumb's up to Tim Vernimmen, who is the science writer working for the online popular science magazine Knowable, which is published by Annual Reviews (AR) in order to communicate the science to a wider audience and is currently working on a story about the One Health approach. I just did an interview with him & he is really going for the scientific angle, as well as value of the One Health approach. I think he has reached out to you. I told him that you might be too busy to answer, so I suggested that if that is the case, Hongying could potentially speak with him.

Just let us know if we can be of support to you & know that we are grateful to you,
Jonna

Jonna AK Mazet, DVM, MPVM, PhD
Professor of Epidemiology & Disease Ecology
Executive Director, One Health Institute
Director, One Health Workforce – Next Generation of USAID Emerging Threats Division
Director Emeritus, PREDICT Project of USAID Emerging Threats Division

School of Veterinary Medicine
University of California, Davis
onehealthinstitute.net

Institute for Global Health Sciences
University of California, San Francisco
https://globalhealthsciences.ucsf.edu/

For scheduling and logistical issues, please contact:
Ms. Mary Radford
maradford@ucdavis.edu
+1-530-752-3630

From: alexandra zuber <alexandrazuber@atahealthstrategies.com>
To: Alisa Pereira <apereira@usaid.gov>, "ayawe@ohcea.org" <ayawe@ohcea.org>, Cassandra Louis Duthil <clouisduthil@usaid.gov>, "wbikaako@ohcea.org" <wbikaako@ohcea.org>, Elizabeth Leasure <ealeasure@ucdavis.edu>, "daszak@ecohealthalliance.org" <daszak@ecohealthalliance.org>, "wasmith@ucdavis.edu" <wasmith@ucdavis.edu>, "William B. Karesh" <karesh@ecohealthalliance.org>, William Bazeyo <[redacted]>, "f.castillo@berkeley.edu" <f.castillo@berkeley.edu>, Matthew Blake <mblake@ucdavis.edu>, Timothy Wakaabi <twakabi@ohcea.org>, Terra Kelly <trkelly@ucdavis.edu>, "Rabkin, Miriam" <mr84@cumc.columbia.edu>, "oladele.ogunseitan@uci.edu" <oladele.ogunseitan@uci.edu>, Irene Naigaga <inaigaga@ohcea.org>, Jonna Mazet <jkmazet@ucdavis.edu>, Sam Halabi <sfh9@georgetown.edu>, "Sarah Nannyanzi" <snannyanzi@ohcea.org>, Marilyn Crane <mcrane@usaid.gov>, "oromero@haas.berkeley.edu" <oromero@haas.berkeley.edu>, "mnattimba@ohcea.org" <mnattimba@ohcea.org>, "margaritamartins@berkeley.edu" <margaritamartins@berkeley.edu>
Subject: For our SWOT Workshop Tomorrow
Sent: Tue, 7 Apr 2020 21:57:44 +0000
Virtual Workshop (SWOT) AFROHUN Agenda 04.08.2020.docx
Virtual Workshop SWOT AFROHUN 04.08.2020.pptx

Dear all,
We are looking very forward to our first OHW-NG Objective 3 Virtual Workshop tomorrow, on the SWOT facing AFROHUN's Organizational Sustainability. Attached is the SWOT analysis presentation we will deliver and the agenda for the meeting that we discussed last week.

Please take a moment to review this presentation before tomorrow, and have it accessible during our meeting. We will be using polling, chat box, and group break-out features tomorrow, to make our session more interactive. To enable this, where possible, please log-in using your computers or the Zoom mobile app. However, we have included a conference line if that is not possible.

Thanks all,
OHW-NG Obj 3 team

Alexandra Zuber, MPP, DrPH
Founder and CEO, Ata Health Strategies, LLC
Email: alexandrazuber@atahealthstrategies.com
Phone: +1 (617) 680-3950
LinkedIn: alexandrazuber/
Website: www.atahealthstrategies.com
Twitter: @alexandrazuber

USAID
FROM THE AMERICAN PEOPLE

Virtual Workshop: SWOT facing AFROHUN's Organizational Sustainability

Objective 3 global team
OHW-NG
April 2020

UCDAVIS One Health Institute School of Veterinary Medicine
OHCEA Championing One Health
SEAOHUN Southeast Asia One Health University Network
ICAP Columbia University Mailman School of Public Health
EcoHealth Alliance
Ata Health Strategies
Berkeley Haas
Project ECHO
UCI University of California, Irvine

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Meeting Objective:

- To obtain a common understanding of the strengths, weaknesses, opportunities and threats facing AFROHUN's organizational sustainability.
- To obtain agreement on priority issues to address in Year 1.

UC DAVIS One Health Institute School of Veterinary Medicine
HCEA Championing One Health
SEAOHUN Southeast Asia One Health University Network
ICAP Columbia University Mailman School of Public Health
EcoHealth Alliance
Ata Health Strategies
Berkeley Haas
Project ECHO
UCI University of California, Irvine

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Agenda:

- Hour 1
  - SWOT analysis methods
  - Strengths
  - Weaknesses
  - Threats
- Break (5 min)
- Hour 2
  - Opportunities
  - Discussion: Defining priorities for Year 1

UC DAVIS One Health Institute School of Veterinary Medicine
HCEA Championing One Health
SEAOHUN Southeast Asia One Health University Network
ICAP Columbia University Mailman School of Public Health
EcoHealth Alliance
Ata Health Strategies
Berkeley Haas
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UCI University of California, Irvine

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Objective of the SWOT

Analysis

Analysis internal stakeholders regarding the strengths, weaknesses, opportunities and threats facing AFROHUN's organizational sustainability

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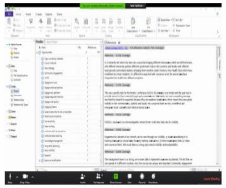
SEAOHUN Southeast Asia One Health University Network
ICAP Columbia University Mailman School of Public Health
EcoHealth Alliance
Ata Health Strategies
Berkeley Haas
Project ECHO
UCI University of California, Irvine

Methods

- The SWOT analysis was led by Alexandra Zuber and supported by Federico Castillo and Omar Romero-Hernandez, from March 1- April 7, 2020.
- Data collection: March 1- 27, 2020
  - Interviews: AFROHUN Secretariat Staff (n=10)
  - Interviews: Deans (n=2)
  - Interviews: AFROHUN Board Members (n=2)
  - Interviews: Previous focal persons (n=1)
  - Focus Group Discussion: AFROHUN Country Managers (n=1, 7 participants)
- Transcription (non-verbatim) & Qualitative analysis in NVIVO: March 30- April 6, 2020



Screenshot of NVIVO database

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Strengths

Organizational Strengths

Select comments on organizational strengths

Core team is very strong and is able to manage effectively

We have visionary leaders who love the network and want to see it grow. Our governance structures are strong, and the team is motivated.

Well organized work planning process. Every year, the Secretariat staff comes to (our country) and we plan together, how they will be done, what is the budget, and who will be the activity lead. We write reports every time we complete the activities and we are really monitored, and that way we ensure all the activities are carried out and lead to the expected outcomes.

Strong accounting systems, we have not had a loss in the five years under OHW. We put up systems that are very strong. We do our budgets well and we follow them closely.

You have to follow-up with each country and make sure they know what they are doing. Country liaisons are senior staff assigned to oversee countries with technical and financial responsibility for each country. We have weekly calls with country administrators to ask questions, keep updated on progress, using app/ skype/ Zoom in. We also have calls for country administrators and Deans.

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Programmatic Strengths

Pre-service education (14/16 respondents)

- Curricula development referenced as systematic and sustainable
- Faculty development

Student clubs (6/16), and experiential learning more broadly (5/16)

- Mentioned repeatedly as most impactful activity
- Experiential format considered highly impactful and popular with students, and

Regional / continental approach (7/16)

- Synchronizing planning across countries
- Fostering south-to-south collaboration, sharing of resources

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Select comments on programmatic strengths

Curriculum. OHCEA took an aggressive approach to doing gap analyses and then incorporating those analyses into curriculum, modules, and networking actions with OHCEA partners. … When new, significant partners emerged, like GHSA, OHCEA identified goals that would be synergistic.

Activities that improve curricula … These offer long-term benefit beyond the students trained. Either we are enhancing faculty to deliver One Health education or creating spaces for faculty innovate and develop processes themselves. …As compared to once-off training which comes and goes.

Curriculum reviews… have been embedded in the routine trainings of the country. With or without AFROHUN or USAID, the OH approach can continue.

Coming together and synchronizing activities across the continent. And then the network was able to follow-up with the activities in each of the countries.

The network in itself, and bringing all these people on board is a strength. There are a lot of materials and opportunities for collaboration on research, and shared teaching within the network.

We have benefited from south-to-south collaboration… and having technical expertise from other partners.

Student clubs—targeting young and changing the way they think. Bringing them together, having them appreciate other disciplines from the start. It is student-led, so students run it.

The biggest impact we've had as AFROHUN is the student clubs.

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Discussion: Are we missing any important AFROHUN strengths?

- Please enter your comment in the chat box and then let's discuss.

Strengths- what makes AFROHUN unique?

- **It is university-led/ comprised of universities**
  - Provides institutional sustainability for activities
  - Engenders trust among stakeholders as politically neutral & high in technical capability
  - Improves visibility with national stakeholders and communities
  - Provides strong technical expertise, "hubs of knowledge as universities
- **Bridges theory and practice**
- **Its mission focus on OneHealth workforce capacity-building (versus service delivery)**
- **It brings together multiple sectors and disciplines**
- **Spans pre-service and in-service capacity**
- **Regional approach, continent-wide**
- **Mature network with a strong reputation**

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Selected comments on what makes AFROHUN unique

We have protected access to students and academic programs. Many people can develop training programs, but they are not academic programs.

These institutions take our ideas and courses as theirs, taking us a long way towards visibility and sustainability.

There is that freedom to be neutral being universities- it gives us a unique opportunity to impact different sectors.

Governments trust universities, they know what universities can deliver, (their staff) have gone through universities themselves.

One dollar given to AFROHUN can benefit many countries.

The type of network that we have in AFROHUN is really unique in Africa. When you see Afrique One Aspire HORN, and SASID, they are all regional projects. But AFROHUN is extending from West Africa to Central, and Eastern Africa. This is important covering different political zones with different picture of OneHealth issues.

AFROHUN is connecting three distinct domains—WHO is not doing that, OIE is not doing that. We should be able to build on that, and have a bigger impact.

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Poll: What are the two most important differentiators?

Weaknesses

Weaknesses

- **Staffing and Capacity Development (n=15/16)**
  - Staffing numbers too low at the Secretariat; departments need>1 staff
  - Succession planning (leaders, Board)
  - Grant-writing and other resource mobilization
  - Research administration and publication
  - Communicating to policy-makers and raising visibility of AFROHUN
  - Leadership- personal, organizational, and adaptive management
  - Finance and project administration at the country-level

> *We don't have a strategy for HR development.*
>
> *We need personal leadership, leadership of organizations, adaptive change management….there are a lot of changes happening very quickly, we need to be adaptive. We can't continue doing business as usual and be stuck in the old-fashioned way of doing things.*
>
> *Strengthening of financial and administrative systems at country level is something we would like to strengthen. We could be good at regional level, but we need more help at country level.*

Weaknesses

- **Resources (n=15/16)**
  - Donor dependence
  - No strong evaluation to show impact to partners to garner funding
  - Dependence on AFROHUN leadership for resource mobilization
  - Lack of dedicated person to write grants at country level
  - Lack of deliberate resource mobilization strategy. "we need a plan"
  - Unaware of funding opportunities

A general comment is that we are AFROHUN have a strong program mandate, but we do not have much in resources to deliver the program. We end having interests of the financiers promoted. We could come up with a beautiful financial plan, but we are only able to respond to the areas that our financial partners need. So we aren't an organization that can pursue it strategic interest.

Institutionally, we need to determine specifically what we need resources for. If we stop just at the level of programs, or we don't project what is needed. We need to define it, cost it, and seek for resources. Our strategic plans in the past are not costed.

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Weaknesses

- **Finding our niche and moving beyond "project model" (n=8/16)**
  - Need to define "what AFROHUN is known for"
  - Some activities seen as "once-off", and not connected to larger program areas
  - We don't plan activities beyond one year time horizon
  - Need to diversify programming
  - Activities are often continued without greater strategic vision

> *We need to diversify our areas of programming;… Because of the nature of funding, we are leaning heavily on zoonotic diseases… We could examine food security, climate change. Even NCDs in terms of One Health.*
>
> *We need to develop programs and work streams, and move away from project-based delivery. We could have a program on climate change, and have several projects in there… and a program on zoonotic diseases and have projects under there.*
>
> *We need someone to scan, conceptualize and create a new program*

Weaknesses

- **Communications and raising visibility for AFROHUN (n=7/16)**
  - Better documentation of project activities and sharing with partners
  - Better south-to-south collaboration across the network
  - Lack of visibility limits potential members and partnerships
  - Improving country-level communications with policy-makers
  - Communication with communities and universities and soliciting their needs / interests

The network lacks some visibility in the countries where it is operating. Due to limited resources, we can't always showcase what students did to wider audience.....special training of country managers to ensure that visibility at country level and region at large...would be really good. When I compare this network to SEAOHUN, SEAOHUN's visibility is far greater.

There is not enough dissemination of information about our activities and benefits ...to universities that are not members.

OHCEA has not been communicating enough, especially regarding policy briefing communications. We do publish, but not for local consumers. But it would be good to think about capacity-building for our teams in terms of communication skills for policy-makers.

Cross-country collaboration; I don't really see that happening. A strength is having the network, and (the Dean's Summit), but I don't see that time well utilized beyond the agenda we are there for. There could be side meetings, discussing proposals, research.

Weaknesses

- **Lack of research (n=7/16)**
  - Part of AFROHUN mandate but neglected
  - Could be part of student and faculty training
  - Need to establish evidence-base for project work: we may be implementing without evidence
  - We are underutilizing our own data, which we could use to analyze
  - Can use this to translate in to advocacy for policy at the country level

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We don't have any work in monitoring and research and in OneHealth this important, such as in vaccine development and AMR. But we should be able to develop research, such as the migratory pathway of pathogens in specific locations. We should connect AFROHUN to initiatives like the Global Virome Project, using the platforms we have in Africa, to address specific issues.

We have access to professors in various disciplines to build the science.

To have our strength and capacity-building is not enough—we need research to inform program and policy and need results to inform community service to have an impact on what our vision is. If we want to see an improvement in our health and well-being, then we need to have a link with those pillars.

~~Is there any area you haven't been able to pursue because it's not of interest to the donor?~~ We have several, research is a major one. Our program would be stronger if we could do research. And (our work in) policy, based on the evidence we generate, could also be better.

Weaknesses

- **Local ownership of AFROHUN activities by communities and universities (n=7/16)**
  - Need greater support from university leadership at higher levels due to Dean turnover
  - Need to widen the scope of programs engaged within our member universities
  - Universities may not feel they "own" activities because of funding approach
  - No systematic consultation of communities or universities to identify needs

We need to take the university management aboard, so they know about our activities. If we are in good communication with university management, it makes it much easier to get things done.

What does AFROHUN do presently to solicit needs of universities and communities? It's not purposeful– it's random.

I read our M&E report that community members mentioned the teaching is good, but they were not asked what topics they want us to handle; "they just teach us what they want and go back." This means we didn't engage them in what they wanted to learn… and we are not dealing with the gaps or challenges of the community. Our approach is a more top-down than bottom-up. If we don't consult community, it affects ownership and sustainability.

Most of the colleges don't feel they are part of OneHealth. They see OneHealth as something for veterinarians and public health. The core sciences, technology, don't feel they are actually part of the network. We need to widen the scope and open up the network.

Right now we are seen as a member, but the project is not within the university. Yes, our staff are leading it, but the project is not seen as a university project. AFROHUN has its own account, from which the university does not benefit at all.

I realized that while OHCA works with universities, OHCEA was registered as an NGO, like any other parallel project.

Poll: What are the most important weaknesses that affect AFROHUN's organizational sustainability?

Threats

Threats

- **Donor dependence**

Funding beyond five years. I know it's been ongoing for 10 years, but you never know what happens in five years, and if there is no funding, I don't see the network moving forward. That would be a big threat. If AFROHUN keeps growing, with new members and activities, how do we make sure to keep everyone involved and engaged could also be a risk.

It goes back to resources. We want to do a lot, but we are still hand-cuffed in terms of finances. There are certain activities that may be 'disallowable'- there are some activities that may not be supported by USAID funding. A case came up last year regarding medications- USAID said the expense was disallowable- if management did not have any other funding, what would we have done? We can't go "all-in".

Some of the events that are happening with diseases is an opportunity to highlight the need for OneHealth however if resources are not available it does not allow for activities to take place, I see that as a threat.

Threats

- **Dean Turn-over**

Frequent changing of leadership at university level actually affects functioning of AFROHUN.

The high turnover for two years, they sit at the summit for 4 times and then leave. When you see a Dean starting to love the network, then their term is over and they have to go. The Board is more stable, which is good. New Deans come on board with a lot of questions, entitlements.

The Summit is composed of Deans, but their turn-over is very high. Just as they get to know the network is, they change. Stability and institutional memory is not kept. Also, when they are a Dean, their involvement in OHCEA is minimal. Former Deans are still there (at universities)—maybe they can be a force to support the network, mobilize resources, networking with other organizations.

Threats

- Other threats mentioned include: adaptability to rapid change, exogenous factors (e.g. political instability, currency fluctuations), regional office not being housed in an established institution for sustainability, failure of key stakeholders to full appreciate / understand OneHealth and its importance, shortage of AFROHUN staff and capacity, and growing competition from other actors.

If we do not act fast, to carve out our niche, we run the risk of being passed over. There are many actors. When we started, OH was not as much. But now there are many players coming, even in capacity-building. If we are not aggressively advancing our area, we run the risk the space for us will shrink.

We should engage higher authorities at universities than just Deans, such as Vice Chancellor and Chancellors, to see if they can have our interest at heart.

Strong institutionalization can drive institution forward. Our vice-chancellor has been nicknamed "One Health Champion" – this is a success for institutionalizing of ... presence as government departments.

If we approach people who do similar activities as we do and map out the contribution of each and do it in a way that we are not duplicating, that would be helpful

AFROHUN should expand its teams to other related topics that are not core part of the network, such as the environment.

We need to carve out our niche. We can add topics on biodiversity and ecosystem services…climate change…planetary boundaries is a concept that we can look at. So far, we are looking more at human-animal. Environment has not been included or barely included in to the discussion.

Integrate new disciplines

UCDUSR0009790

How can AFROHUN mitigate these threats?

Engagement

Documental & Communication

Maximize Dean's Summits

We need to document our impact and value and document the impact value of OH education to these sectors.

At the university, we are not part of the government's OneHealth coordinating center. In the case of an epidemic, they can call the university to assist. The link of central government to university as far as funding does not exist.

We need communications training, on how to share the message on OneHealth, it would be great for people to be trained in OD-eds, writing scientific papers, on how to explain OneHealth, and why it's important.

I do see the value of the Dean's Summit, but if it can be expanded to do some work-shopping, some side meetings. These meetings happen every 3-4 months, and bring people across the continent, I don't think they are worth the time and money unless they are better utilized, such as to generate proposals.

in a program—any monitoring or evaluation what students learned in the program, (comparing) before and after. To measure and monitor what competencies are achieved would be helpful.

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Are we missing any important threats to organizational sustainability?

- Please enter your comment in the chat box and then let's discuss.

Break (5 min)

Opportunities

Most Commonly Referenced Opportunities to Strengthen AFROHUN's Organizational Sustainability	# interviews referenced (n=16)
Engage national partners, including government and other sectors	16
Research	12
Resource mobilization	12
Grant-writing	10
Expand networks to new universities	9
Engage new partners & stakeholders	8
Raise visibility	5
Address COVID	4
Contribute to national policy-making	4
Engage regional networks	4
Improve engagement of Deans	4
Engage "end-user" (communities, universities)	4
Train lower level providers	3
Improve knowledge management	3

Opportunities

- **Engage national governments**
  - Participate in national OH platforms
  - Contribute to national policy and advocacy fora
  - Sensitize national governments to "own" OneHealth
  - Obtain government buy-in, and funding, to activities

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Before USAID EPT-2, country coordinating committees had made a lot of difference in countries because they drew from service providers, stakeholders, and public health.

The Board also agreed each member university should introduce and sensitize the national governments with the intention to get government buy in and eventual support through government budgets.

In (our country), when we have a OneHealth Policy Forum, when we contribute at the national level, it really makes a big difference. When we are bringing government and universities together in a roundtable, this will serve a lot.

We need to move more in to governmental engagement. We have data generated that we could actually interrogate to engage governments.

(Interviewer: are you aware of where in AFROHUN where this link to national governments is stronger?) In (our country), when the OneHealth coordination desk was established, AFROHUN's focus points were very involved. But now with respect to COVID, I don't see universities being involved. So the link is not clear.

Opportunities

- **Advancing OneHealth Research**
  - Develop an agenda
  - Obtain grants and funding
  - Capitalize on technology advancements
  - Improve impact of OneHealth activities (providing evidence-base)
  - Identify knowledge gaps
  - Need research capacity-building of students, country managers

Developing a research agenda and niche should also happen soon: this shouldn't wait.

The research piece has been missing from my perspective; the ability to obtain grants and research funding, establishing a center for research, could be an opportunity to bring in staff and projects.

Opportunities

- **Resource mobilization**
  - Need to elaborate funding needs before we attempt to raise funds
  - Charge fees for some courses and CPD, online offerings
  - AFROHUN could serve as a consultancy
  - Donor conferences
  - Invite "buy-in" from public and private universities, membership fees
  - Following U.S. model, connect Deans to their university partnership/ development teams

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For in-service, we can make sure some are taken up by the CPD programs, so they are owned by governments. Also in friendly delivery models, such as online.

We are very happy that this project has a very specific focus on this area. We need to elaborate our funding needs- what is it that we are looking for resources for? …We need to scope out the right potential partners that provide the right resources. We need to start with a well- developed program first.

We should look for new avenues for revenue generation activities, such as offering CPDs or other trainings for cash. Undertaking consultant services, and undertaking joint ventures with partners.

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Opportunities

- **Grant-writing**
  - Expand grant-writing department at AFROHUN
  - Create a centralized place for countries to work together on grants
  - Tension between university or country –specific grants and regional grants
  - Need for training of faculty in grant-writing

I personally think that the grant-writing person should remain at the Secretariat, but there is a need to beef it up. It is a one-person position.

In the last initiative, we had a training on writing a success story and on grant-writing. We learned we can use the previous activities as a proof of concept to write bigger proposals.…We should be able to get countries to write proposals and mobilize other funds…

We need to clarify the value when (countries) write proposals as part of AFROHUN. We have written proposals to the Rockefeller Foundation, the U.S. Department of Defense, CDC, and others that were cross-network and even transnational…There are many opportunities, but it's hard to incentivize for network-specific grants.

Opportunities

- **Expanding network to new universities and countries**
  - Expanding to new disciplines and degree programs
  - Expanding universities within existing member countries
  - Expanding to countries across Africa
  - Utilize a collaboration framework between universities
  - Improve university 'ownership' of AFROHUN activities
  - Need dedicated unit and "we need a plan"

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In (our country), there is a OneHealth university network which includes all state universities and private institutions. It is strongly recommended that AFROHUN be expanded to other institutions but also look at existing national university networks and have some collaboration framework.

I would like to put emphasis on increasing ownership by universities of the network. There is not a sense of "our network/ my network". The management at the universities do not feel they have ownership. So I really feel AFROHUN should increase the institutional management in order to succeed.

We need to institutionalize capacity-building efforts that have been started on. … This means embedding OneHealth competencies in to many degree programs where it is not currently.

Opportunities

- **Engage new partners**
  - Identify gaps between OneHealth organizations at the country level and bring connectivity
  - Connect with other OneHealth initiatives in the region
  - More partnership building, with private and public sector, and with international organizations
  - Conduct/ strengthen stakeholder mapping; some occurring at country-level
  - Reduce duplication/ redundancy between organizations

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There are many gaps between the functions of OneHealth organizations, international organizations, and non-governmental organizations that do not communicate or coordinate. The network could play a vital role there.

We should connect, as soon as possible, with other OneHealth initiatives on the continent.

We need to define our key partners- who are they? We need to synthesize them and decide "let's engage with them".

Our stakeholder engagement processes—right now it is "random". We could have some systematic processes where we prioritize.

(In our country) we have a national OneHealth platform, and a national AMR platform. And we have other stakeholders, most funded by USAID. This is a huge activity, we could see activities implemented jointly with other partners (e.g. IDSS USAID project in Cameroon). How do we put our activities together with government and other partners?

Opportunities: What role would you like to see AFROHUN play in the region/ world in the short/medium/ long term?

SHORT-TERM	MEDIUM-TERM	LONG-TERM
Connect with other OH initiatives on the continent	Expand to non-member universities and countries	Establish a center of excellence in OneHealth
Define niche	Integrate OH curricula in all universities	Better centralize what OneHealth means for the continent
Identify best practices and evidence-base from our work	Develop proposals for funding	Become recognized as leaders in OneHealth in Africa
Share opportunities widely	Champion innovations platform to mentor student innovations	Expand and cover all of Africa
Address COVID, e.g. helping governments to prevent COVID	Advance science and policy	Provide leadership in response to outbreaks
Document and profile expertise of the network		Drive OneHealth agenda on the continent
Develop research agenda		

Discussion: Were any important opportunities missed?

- Please share your comment in the chat box and then let's discuss.

Polling: What are the most important opportunities to advance AFROHUN's organizational sustainability?

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Discussion: Priorities for Year 1

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Break-out groups

- We are going to break you in to small discussion groups. For the allocated time, please answer the following questions. Please wrap-up your discussion by ____. We will then give you a 60 seconds warning and bring you back to the group for a large-group discussion.
  - Considering that we under limited resources, which issues are priority to address in our Y1 collaboration?

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Agenda

Virtual Workshop: SWOT, AFROHUN Organizational Sustainability

OHW-NG Objective 3 global team and AFROHUN

April 8, 2020

Meeting Objective:

- To obtain a common understanding of the strengths, weaknesses, opportunities and threats facing AFROHUN's organizational sustainability.
- To identify priority issues to address in Year 1.

We will be utilizing group polling, chat box, and break-out groups during this workshop to maximize group collaboration. Please try to dial-in using the Zoom via computer, or via the mobile app, wherever possible. A conference line is provided should there be any limitations to internet.

Agenda:

Hour 1

- SWOT methods
- Strengths: Short presentation followed by group discussion
- Weaknesses: Short presentation followed by group discussion
- Threats: Short presentation followed by group discussion

Break (5 min)

Hour 2

- Opportunities: Short presentation followed by group discussion
- Discussion: Defining priorities for Year 1

Zoom details:

Omar Romero-Hernandez is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

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888 788 0099 US Toll-free
877 853 5247 US Toll-free

Meeting ID: REDACTED

Find your local number: REDACTED

From: Alok Jha <alokjha@economist.com>
Sent: Fri, 26 Jun 2020 12:56:18 +0100
Subject: Thank you - and a final request
To: Jonna Mazet <jkmazet@ucdavis.edu>, Peter Daszak <daszak@ecohealthalliance.org>, gvp@ucdavis.edu, Dennis Carroll
REDACTED

Dear Jonna, Dennis and Peter,

Thank you for all your help with my article on preventing future pandemics. It is published in this week's Economist: https://www.economist.com/science-and-technology/2020/06/25/pandemic-proofing-the-planet

I have one final request - The Economist would like to use some clips of our Zoom interview to help make a short science podcast focusing on preventing pandemics. I hope you would be happy for us to do that? I've copied in podcast producer Jason Hosken to this email if you have any questions but suffice to say that your clips would be used to explain the background of the issues we discussed and for your descriptions of GVP and how such a project could be useful for future pandemic-planning. The podcast would help us to get the issues in the story out to a big new audience.

Thank you and I hope we can keep in touch as you develop your future plans for the GVP. Do let me know if when you hit milestones or launch new projects in the area.

Best,
Alok.

Alok Jha
Science correspondent
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From: Kevin Olival <olival@ecohealthalliance.org>
Sent: Mon, 3 Aug 2020 12:34:52 -1000
Cc: predict@ucdavis.edu, PREDICTMGT <predictmgt@usaid.gov>, Ava Sullivan <sullivan@ecohealthalliance.org>, Aleksei Avery Chmura <chmura@ecohealthalliance.org>, Peter Daszak <daszak@ecohealthalliance.org>, William Karesh <karesh@ecohealthalliance.org>, Jon Epstein <epstein@ecohealthalliance.org>, Mindy Rostal <rostal@ecohealthalliance.org>
To: Supaporn Wacharapluesadee [redacted] Thiravat Hemachudha [redacted] Prateep Duengkae [redacted], Patarapol Maneeorn DVM DVM [redacted]
Subject: [predict] PREDICT Thailand report now online!

Dear Supaporn, Thiravat, Prateep, Lot, and the PREDICT Thailand team,
Through a lot of hard work from many people including you and the entire in-country team, PREDICT global consortium partners, our EHA team, and especially UC Davis and the editing and design team, we have now released all of the country final reports on our website with the exception of Liberia, Malaysia, and China (coming soon). I encourage you to look at all the many success stories around the world, but a link directly to the Thailand report is here.

In addition, PREDICT also delivered a draft 5 year report to USAID last week that includes the many Global sections, Country Reports, and a massive Appendix of our deliverables. These pieces will each be finalized soon as PREDICT close-out and legacy products. Please feel free to view and distribute the PREDICT global report highlights here: https://p2.predict.global. These include overviews of Strengthening Health Security, Surveillance, Pathogen Discovery, Emerging Infectious Disease Insight short reports, and more — and will be updated as additional products and pages are finalized.

On behalf of everyone involved in PREDICT, thank you for your hard work over the years in making the project such a huge success in Thailand and globally!

Please distribute the PREDICT-2 reports to other members of the PREDICT Thailand team not included here, and to other stakeholders in country. It would be great for us to track how the reports are being distributed and used, so please do follow up as you hear back from government and other stakeholders.

Best regards,
Kevin

Kevin J. Olival, PhD
Vice President for Research

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www.ecohealthalliance.org

EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.

From: Sudarat Damrongwatanapokin <sdamrongwatanapokin@usaid.gov>
Sent: Tue, 4 Aug 2020 15:06:55 +0700
Subject: Fwd: P2 Thailand final report
To: "Wongsathapornchai, Kachen (FAORAP)" [redacted] Wantanee Kalpravidh [redacted] Filip Claes [redacted], Noppavan Janejai [redacted] Prasert Auewarakul [redacted] Pilaipan [redacted], "Pattarap[ol Maneeon" [redacted] WeerapongThanapongtham [redacted], Anuwat Wiratsudakul <anuwat.wir@mahidol.edu>, Pasakorn Akarasewi [redacted] Khanchit Limpakarnjanarat [redacted], Darika Kingnate [redacted] Kumnuan Ungchusak [redacted], Sopon Iamsirithaworn [redacted], Ratanaporn Tangwangvivat [redacted] woraya [redacted] Saowapak Hinjoy [redacted] Pojaporn Pinrod [redacted] Saengduen [redacted], Vipat <vipat@seaohun.org>, Parntep Ratanakorn <parntep.rat@mahidol.edu>, witthawat Wiriyawat [redacted] Suwit Wibulpolprasert [redacted], Thiravat Hemachudha [redacted], Latiffa Hassan [redacted] Jintana Sriwongsa [redacted] Ong-orn Prasanpanich <odh2@cdc.gov>, "MacArthur, John R. (CDC/CGH/DPDM)" <zae5@cdc.gov>, Wansane Toanan [redacted], "D.Thanarak Plipat" [redacted]
Cc: Daniel Schar <dSchar@usaid.gov>, Karoon Chanachai <kchanachai@usaid.gov>, Supaporn Wacharapluesadee [redacted], "Clements, Andrew(ANE/TS)" <AClements@usaid.gov>
Bcc: jkmazet@ucdavis.edu
FINAL+REPORT+COUNTRY-THAILAND-FULL.pdf

Dear Colleagues,
Attachment is the PREDICT Thailand Final report, One Health in Action (2009-2020). Interesting write-up from key achievements, surveillance, detection, virus findings, epi and behavioral risk, risk communication and community engagement, capacity building on outbreak preparedness and response....pave way to Maps and Models for **Thailand Virome Project and Partnership (TVPP)**
as a part of the Global Virome Project.

The report includes special features: 1) Tham Luang Cave Rescue, 2) MERS-CoV Preparedness and Early Detection, and 3) COVID-19 Detection in Thailand.

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Surely, you will enjoy reading it.

Best regards,
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---------- Forwarded message ---------
From: **Sudarat Damrongwatanapokin** <[redacted]>
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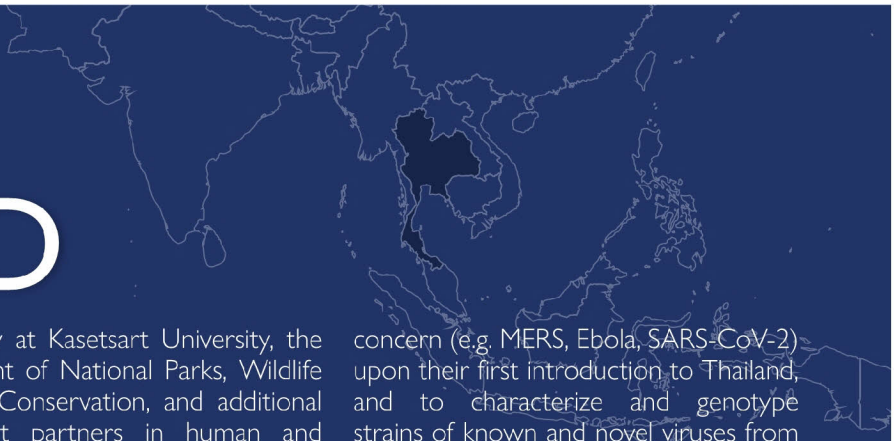
Subject: P2 Thailand final report
To: Daniel Schar <dschar@usaid.gov>, Karoon Chanachai <[redacted]>, Sudarat Damrongwatanapokin <sdamrongwatanapokin@usaid.gov>
Cc: <[redacted]>

P2 Thailand final report shared with us by Dr. Supaporn.

https://static1.squarespace.com/static/5c7d60a711f7845f734d4a73/t/5f24d86e98d3e908c2dd4e25/1596250245348/FINAL+REPORT+COUNTRY-THAILAND-FULL.pdf

Best regards,
Sudarat
Sent from my iPhone

10 years of PREDICT activities in Thailand has developed leaders in the One Health approach to pandemic preparedness, outbreak response, and viral discovery.



THAILAND

Thailand is a biologically diverse country where ecological changes caused by land conversion and agricultural production are bringing humans into increased contact with wildlife and the pathogens they carry. A diversity of novel wildlife viruses with potential economic and public health importance are circulating in Thailand while the threat posed by pathogens like Nipah virus, coronaviruses, and influenza virus highlights the urgent need to support ongoing research, surveillance, and capacity building efforts. Local community interactions with wildlife in rural settings (e.g. with macaques or flying foxes in temples, or with bats while harvesting guano for fertilizer) represent additional interfaces for zoonotic disease spillover. Bangkok and other areas of Thailand are hubs for the wildlife trade and regional centers of travel and tourism. Thailand is centrally connected via porous borders with Laos, Cambodia, Malaysia, and Myanmar. The high volume of cross-border movement of people, their animals, and trafficked wildlife poses an added risk for transboundary pathogen introduction and spread, including infected travelers bringing in MERS-CoV, Zika virus, Ebola virus, and SARS-CoV-2.

PREDICT in Thailand is led by the team at the World Health Organization (WHO) Collaborating Centre for Research and Training on Viral Zoonoses, Faculty of Medicine, Chulalongkorn University and the Thai Red Cross Emerging Infectious Diseases Health Science Centre, in collaboration with the Faculty of Forestry at Kasetsart University, the Department of National Parks, Wildlife and Plant Conservation, and additional government partners in human and animal health. The project leverages these groups' expertise discovering novel viruses in humans and animals, and has increased these capabilities, especially for surveillance of specific pathogens. Capacity building is essential to the sustainability of the program. PREDICT project activities helped build the skills, systems, infrastructure, and human resources for emerging infectious disease preparedness within the teams and institutions involved in the project, and on a larger scale as these skills and practices have been adopted by additional government partners.

Ten years of PREDICT project activities helped strengthen an early warning 'One Health' system for emerging infectious disease (EID) preparedness capacity in Thailand, as implementing partners gained expertise in safe and humane wildlife sampling, human sample collection for unknown disease detection, behavioral risk research, laboratory testing and cold chain, and disease modelling and data analysis. In addition, through analysis of project data and findings, the PREDICT team was able to identify risks and educate communities and health professionals on behavior change and intervention strategies designed to protect people and wildlife from disease threats. PREDICT project PCR protocols have been widely implemented to identify known pathogens of international concern (e.g. MERS, Ebola, SARS-CoV-2) upon their first introduction to Thailand, and to characterize and genotype strains of known and novel viruses from people and animals. Due to its abundant experience diagnosing EID viruses over the past 10 years, PREDICT Thailand's laboratory has been designated the Ministry of Public Health's reference laboratory for identification of EIDs. The first imported MERS case in Thailand in 2015 was identified and confirmed by the PREDICT lab team in country within 24 hours after receiving the specimen. During the Ebola outbreak in Africa in 2014, a PREDICT project protocol was used to test human biological samples from suspected imported cases in Thailand during the first few months when the standard diagnostic assay was not available in country. The PREDICT project in Thailand has also facilitated collaborations both nationally (Thai National Science and Technology Development Agency (NSTDA) and Thailand Research Fund) and internationally (United States Defense Threat Reduction Agency's Biological Threat Reduction Program (US-DTRA BTRP) to achieve EID monitoring and preparedness in the country. Thailand is a success story for capacity strengthening within the PREDICT project and has become a regional leader in laboratory diagnostics and training – working with partners in Myanmar, Laos, Malaysia, Indonesia and beyond regularly exchanging information and leading joint lab and field training activities.

LOCAL PARTNERS

- WHO Collaborating Centre for Research and Training on Viral Zoonoses
- Thai Red Cross Emerging Infectious Diseases Health Science Centre
- Faculty of Medicine, Chulalongkorn University
- Faculty of Forestry and Faculty of Veterinary Medicine, Kasetsart University
- Thai Department of National Parks, Wildlife and Plant Conservation
- Thai Department of Disease Control, Ministry of Public Health
- Thai Department of Livestock and Development
- Office of Disease Prevention and Control 5
- Loei Hospital
- Health Promoting Hospital, Tambon Wat Luang
- Office of Khao Chong Phran Non-hunting Area
- Phu Luang Wildlife Research Station

Global Health Security Agenda

>310

DEVELOPED the One Health Workforce by training more than 310 people in Thailand.

>4.7K

OPERATIONALIZED One Health surveillance and sampled over 4.7K animals and people, helping minimize the spillover of zoonotic disease threats from animals into human populations.

LABORATORY STRENGTHENING

· WHO-CC Viral Zoonoses Chulalongkorn University

42,781
TESTS

102
PREDICT

50
KNOWN

DETECTED 152 unique viruses in both animal and human populations.

UCDUSR0009822

SUPAPORN
WACHARAPLUESADEE
Country Coordinator &
Laboratory Chief
WHO-CC Viral Zoonoses
Chulalongkorn

"PREDICT is a live exercise program. PREDICT is a One Health University without degree but is so much more. PREDICT is country-strengthening. PREDICT is not just a program, it promotes country's success on EID preparedness. PREDICT is more than just predicting. Without PREDICT, Thailand may have been slow on handling the response to Ebola, MERS and COVID-19 introductions. PREDICT has helped us to gain experience, make unknown pathogens known, and build partnerships and trust."

THANAPOL
PHUTTHARAKSA
Head of Village Health
Volunteers
Chonburi Province

"PREDICT has been very beneficial for communities. Before TRC-EID implemented the PREDICT project in our community, we were not even aware that bats harbored infectious pathogens."

ACHIEVEMENTS

- Early detection of imported human cases of MERS and SARS-CoV-2, and screening for suspected Ebola cases, using PREDICT project diagnostic protocols.
- Trained over 300 people in core skills required for zoonotic disease surveillance and detection, including rangers and staff from the government Department of National Parks, Wildlife and Plant Conservation.
- Collected more than 36,000 specimens from >4,700 individual animals and people at high-risk interfaces throughout 10 years of PREDICT project activities.
- Discovered 102 new viruses and detected 40 previously-identified viruses in viral families with pandemic potential from bats, rodents, and primates throughout 10 years of PREDICT project activities.
- Conducted behavioral risk research to identify zoonotic disease risk factors and trained field staff from the Ministry of Public Health on best practices for in-depth behavioral risk investigations.
- Trained laboratory personnel from the Ministry of Public Health, Department of Disease Control on using PREDICT protocols for novel virus detection.
- Collaborated with the Department of National Parks, Wildlife, and Plant Conservation (DNP) in the investigation of a wildlife die-off event in Kanchanaburi Province.
- Led a health screening for the 'Cave Boys' rescued soccer team to test for exposure to multiple pathogens using PREDICT and other protocols to identify potential zoonoses.
- Expanded local community health engagement to include zoonotic disease awareness and prevention at multiple sites.

ONE HEALTH SURVEILLANCE

The PREDICT team conducted concurrent biological surveillance activities at high-risk animal-human interfaces in the country, focusing on in-depth 'One Health' investigations at three sites over the last 5 years. Putting One Health into action, the team successfully coordinated with local health facilities and the government Thai Department of Livestock Development (DLD) to conduct triangulated human, wildlife, and domestic animal surveillance. While the PREDICT team safely collected samples from wildlife (bats, rodents, and non-human primates) and humans in collaboration with local Ministry of Public health and Community Health Volunteer staff. PREDICT also conducted behavioral risk investigations among healthy humans living in these same sampled communities. In partnership with the Food and Agriculture Organization (FAO), DLD staff collected samples from pigs and other domestic animals alongside PREDICT. DLD staff were then trained on PREDICT project diagnostic PCR protocols and data entry processes using the EIDITH program. This collaboration is a great example of how the project helped bring teams from different sectors together to efficiently and effectively conduct One Health disease surveillance.

The PREDICT team selected sites for One Health surveillance that included interfaces associated with land use change, wildlife consumption, guano harvesting, and human dwellings sited near large wildlife populations in three provinces of Thailand:

- *Loei Province. Loei Province is a typical provincial rural area from northeastern Thailand in the midst of land use conversion, as forest is cleared for production of rice, corn, and cassava. It is also the site of an active rodent trade, as rodent consumption is common. Bats and rodents in and around land conversion areas, human dwellings, and markets were sampled. The PREDICT team also worked with the provincial hospital in Loei to conduct surveillance of patients with hemorrhagic and encephalitic symptoms.*
- *Ratchaburi Province. Ratchaburi Province is in the western part of Central Thailand. Karst (limestone mountain) formations and caves are common, and our surveillance sites included caves where bat guano is collected by hand and sold for local agricultural production. PREDICT previously identified Betacoronavirus Group C (MERS-CoV group) viruses from bat guano collected from this region. Bat guano miners and people working in the bat guano fertilizer trade (sellers, buyers, middle men, handling workers), all high-risk occupations for disease transmission, were targeted for behavioral risk interviews and biological sample collection. Bats, rodents, and non-human primates are abundant at these sites that include tourist attractions and were also sampled as part of our effort to investigate viral sharing between the closely linked human and wildlife populations. Livestock and domestic animals were also sampled around bat roost temples and villages in collaboration with FAO and DLD.*
- *Chonburi Province. Chonburi is a province in Central/Eastern Thailand where there is extensive swine production and mixed agricultural production. Large fruit bat colonies exist in this province where Nipah virus has been previously identified. Fruit bat foraging areas overlap with pig production sites, and the Buddhist temple that harbors bat populations is a local site of worship and a tourist attraction. Fruit bats in the communities located near pig farms were sampled by the PREDICT team while pigs were sampled in collaboration with FAO and DLD partners. A local health promotion clinic, directly opposite a large fruit bat roost, was the site for human community surveillance of people living or working close to bat roosts.*

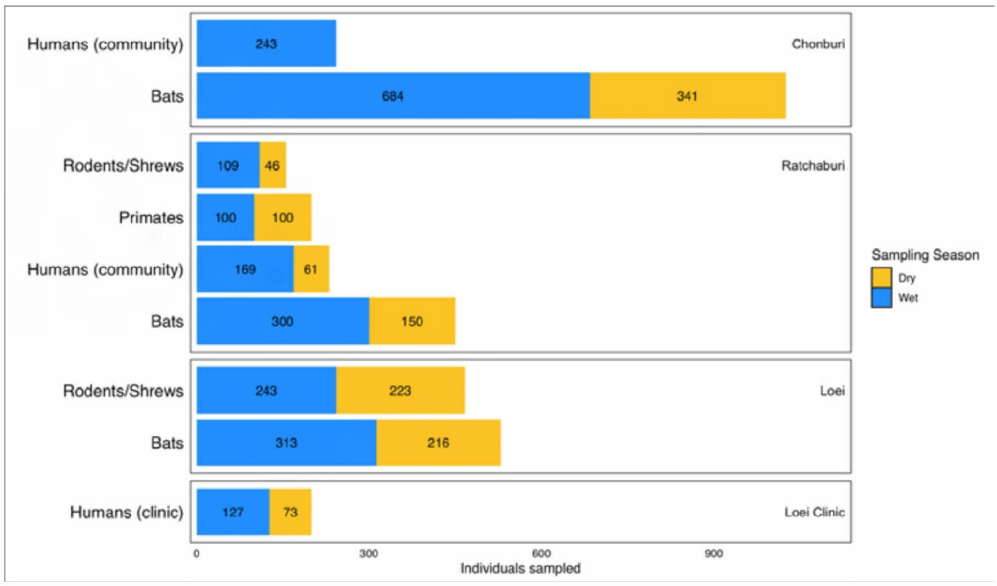


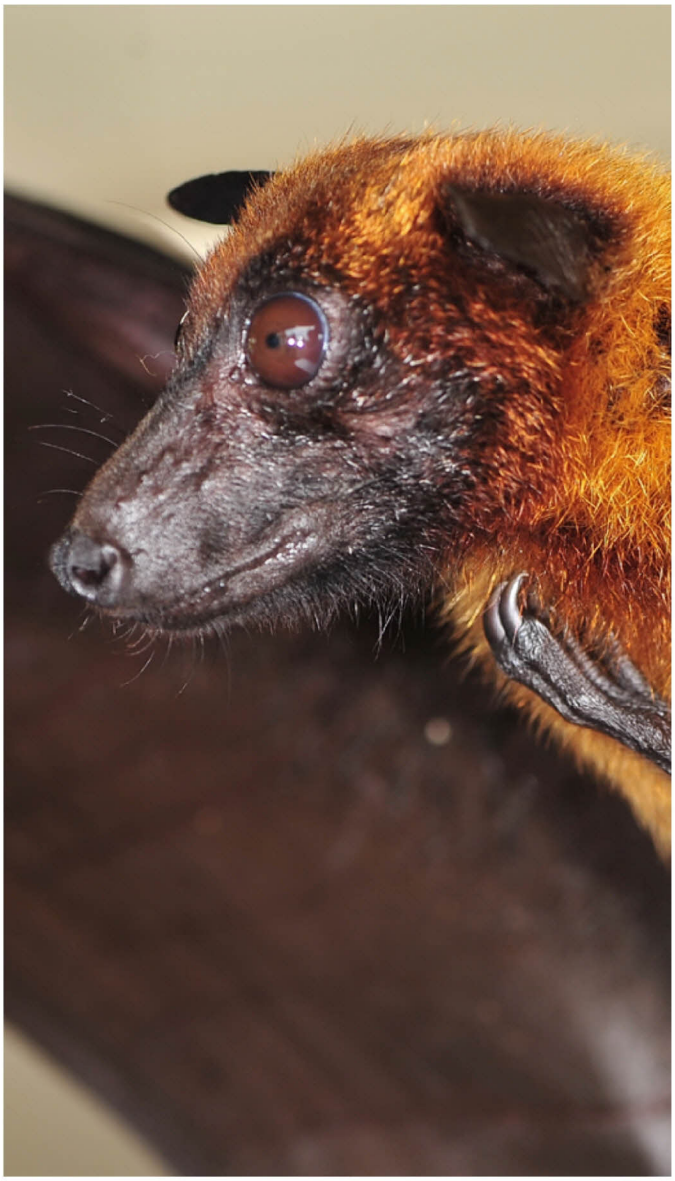
FIGURE 1. Summary of the PREDICT project's One Health sampling efforts at each surveillance site in Thailand.

VIRUS DETECTION

VIRUS FINDINGS IN ANIMALS

The PREDICT project's strategy for viral detection included screening samples using broadly reactive consensus PCR (cPCR) for priority viral families, including corona, filo, flavi, and paramyxo families, and influenza virus. Positives detected using these assays were sequenced to identify the viruses and compare their relationship to known pathogens, and viruses were prioritized for further characterization. This approach allows for detection of both known and novel viruses and improves our understanding of the presence and diversity of viruses, as well as potential pathogens, in humans and animals.

Using this approach, the PREDICT team safely tested 5,397 bat, 1,696 rodent, and 896 non-human primate oral and rectal swab samples. Of these 7,989 specimens tested, 263 were positive for coronaviruses (217 bats and 46 rodents), and 36 for paramyxoviruses (30 bats and 6 rodents). Significant coronavirus findings in wildlife included the discovery of SARS related coronaviruses in roundleaf bats (*Hipposideros* spp.); MERS-related viruses discovered at a bat guano harvesting human interface; identification of Porcine Epidemic Diarrhea virus in bats; four novel bat coronaviruses detected more than 30 times each; and a diversity of other new coronaviruses from both bats and rodents. Significant paramyxovirus findings in wildlife included multiple Nipah virus detections; several new rodent species recognized as hosts for Murine coronavirus – expanding the known host range; and detection and characterization of 15 new paramyxoviruses discovered in bats and rodents. No filoviruses, flaviviruses, or influenza viruses were detected from any wildlife specimens. For details on detections and testing effort for each viral family and host genus combination, see heatmaps and tables below.



	Coronaviruses	Filoviruses	Flaviviruses	Influenzas	Paramyxoviruses
Chaerephon (bats)	3.3% (2787)	0% (1773)	0% (1773)	0% (1773)	0.5% (1773)
Cynopterus (bats)	6.7% (30)	0% (20)	0% (20)	0% (20)	0% (20)
Eonycteris (bats)	12.9% (62)	0% (12)	0% (12)	0% (12)	0% (12)
Hipposideros (bats)	9.9% (71)	0% (35)	0% (35)	0% (35)	0% (35)
Miniopterus (bats)	10.7% (28)	0% (15)	0% (15)	0% (15)	0% (15)
Myotis (bats)	4.5% (22)				
Pteropus (bats)	6.8% (2298)	0% (1498)	0% (1498)	0% (1498)	1.6% (1598)
Rousettus (bats)	0% (7)	0% (2)	0% (2)	0% (2)	0% (2)
Taphozous (bats)	0% (26)				
Canis (carnivores)	0% (153)	0% (102)	0% (102)	0% (102)	0% (102)
Felis (carnivores)	0% (156)	0% (104)	0% (104)	0% (104)	0% (104)
bos (cattle/buffalo)	0.5% (216)	0% (144)	0% (144)	0% (144)	0% (144)
Capra (goats/sheep)	0% (90)	0% (60)	0% (60)	0% (60)	0% (60)
Macaca (non-human primates)	0% (896)	0% (556)	0% (556)	0% (548)	0% (556)
Bandicota (rodents/shrews)	0% (190)	0% (125)	0% (116)	0% (125)	0% (125)
Berylmys (rodents/shrews)	33.3% (6)	0% (4)	0% (4)	0% (4)	0% (4)
Chiropodomys (rodents/shrews)	0% (3)	0% (2)	0% (2)	0% (2)	0% (2)
Leopoldamys (rodents/shrews)	1.6% (61)	0% (42)	0% (38)	0% (42)	0% (42)
Maxomys (rodents/shrews)	2% (51)	0% (34)	0% (32)	0% (34)	0% (34)
Mus (rodents/shrews)	9.2% (87)	0% (58)	0% (55)	0% (58)	1.7% (58)
Niviventer (rodents/shrews)	4.8% (21)	0% (14)	0% (13)	0% (14)	0% (14)
Rattus (rodents/shrews)	3.3% (1317)	0% (879)	0% (848)	0% (879)	0.6% (879)
Unknown (rodents/shrews)	0% (27)	0% (16)	0% (9)	0% (16)	0% (16)

FIGURE 2. Heatmaps providing a summary of sampling effort and detection of positives for the five priority viral families: coronaviruses, filoviruses, flaviviruses, influenzas, and paramyxoviruses. The data are summarized by host at the genus level, and broader taxonomic groups are shown in parentheses. The heatmap data show the percentage of viral positives that were confirmed by sequencing (%) and the number of PCR tests performed (in parentheses). The red color scales with increased viral positives. Host taxa or interfaces that did not test positive are shown in white.

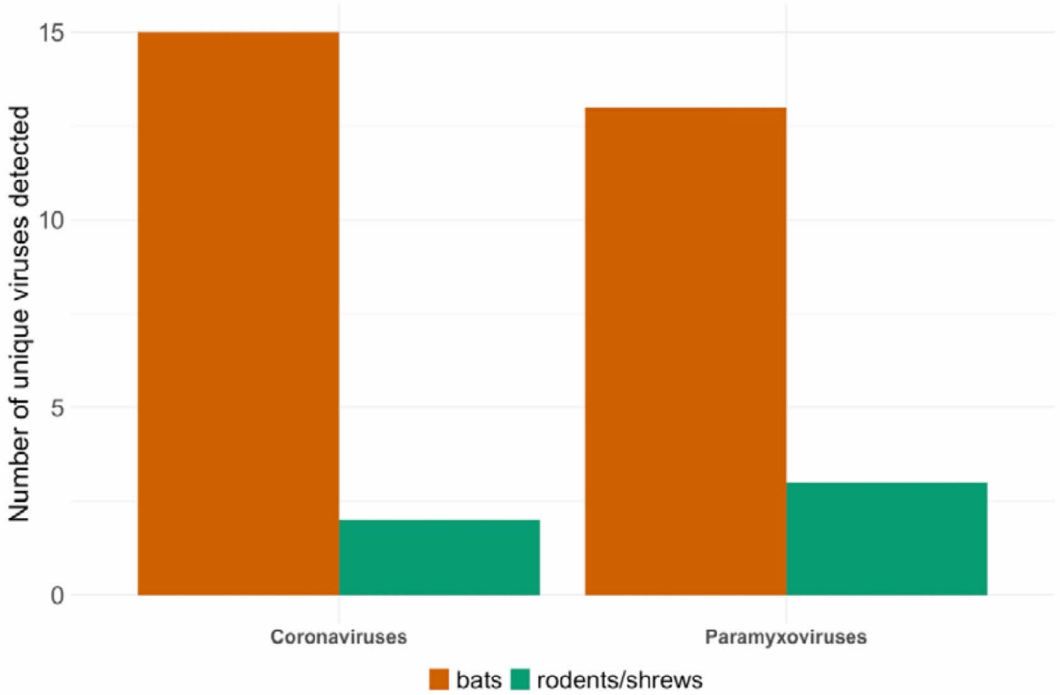


FIGURE 3. Number of unique coronaviruses and paramyxoviruses detected in bats and rodents in Thailand.

In addition to characterizing a number of newly discovered viruses from wildlife, another outcome of PREDICT sampling and testing was expanding the known host range for previously described viruses. For example, 20 new rodent host species were discovered for Murine coronavirus from the PREDICT project sampling efforts, six of these from Thailand. Host range information is important for helping predict spillover potential of viruses, as viruses with a large "breadth" of different hosts are more likely to infect people – as was shown in previous analyses from the PREDICT project (Olival et al. 2017; Johnson et al. 2015).

VIRUS FINDINGS IN PEOPLE

Through partnerships with national and community-level public health experts the PREDICT team conducted both community and clinic-based surveillance for emerging viruses in people. Nine known human pathogens were detected during human surveillance activities, with a majority discovered during hospital and local clinic-based surveillance (Table 1). The most common virus detected was influenza virus, including both Influenza A and B strains, but notable paramyxoviruses including Human Parainfluenza virus 1 and Measles virus were also identified from clinical specimens. Influenza A and B strains were detected in approximately 50 patients from Loei hospital, and interestingly the virus was detected in nasopharyngeal swabs and in many cases also in rectal specimens from the same individuals, or in rectal specimens only (Figure 4, Sangkakam, In Review). This finding has relevance for designing passive surveillance of human influenza strains, i.e. through non-invasive testing of sewage systems.

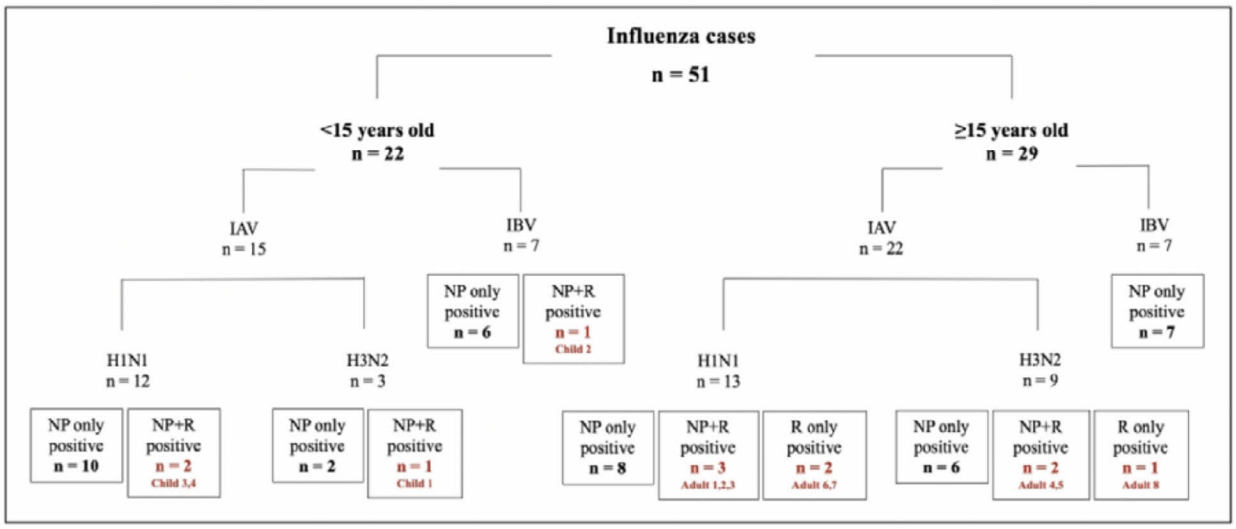


FIGURE 4. Summary of approximately 50 influenza positive specimens (IAV = Influenza A virus; IBV = Influenza B virus) from clinical surveillance at Loei hospital, showing influenza detection in both nasal (NP) and rectal (R) specimens (Sangkakam et al. In Review).

The PREDICT team provided critical support to the Ministry of Public Health (MOPH) and helped facilitate the early detection of imported emerging human viruses to Thailand. This included the rapid detection of MERS-CoV, suspected cases of Ebola virus during the West Africa outbreak, and COVID-19 in one of the earliest cases of spread out of Wuhan, China using PREDICT PCR protocols. The PREDICT and MOPH teams reported detecting the first MERS-CoV case in Thailand which was later published in the Eurosurveillance journal, August 2017 . This success story highlights how using multiple coronavirus and MERS-specific assays at once allowed for rapid detection and coronavirus sequence confirmation within 24 hours, thus halting local transmission.

Other success stories from human surveillance in Thailand include supporting the MOPH´s national surveillance program for hand, foot, and mouth disease. In this case, the PREDICT lab used the project's Enterovirus PCR protocols for testing patient specimens on behalf of the MOPH. Also, as part of national guidelines from the Bureau of Epidemiology, Department of Disease Control, MOPH, PREDICT project protocols (human sampling and PCR) were used in collecting and testing samples from the youth soccer team trapped in the Tham Luang cave and their rescuers. Collected samples were tested at PREDICT laboratories (see Special Features below).

A notable finding from community-based surveillance was the detection of Human Coronavirus HKU1 (HCoV-HKU1) in a bat guano miner (harvester). The PREDICT Thailand team was able to sequence, characterize, and publish this finding in 2019 (Joyjinda et al. 2019). This virus was detected from an individual with a high level of occupational exposure to bat feces, but who was asymptomatic at the time of sampling. While this individual was likely exposed to HCoV-HKU1, a fairly common human coronavirus, due to person-to-person transmission and not via exposure from bats, our surveillance strategy and viral characterization pipeline provide valuable insight into the circulation of endemic infectious diseases in Thailand and increase the country's preparedness for other novel emerging infectious diseases.

TABLE 2. VIRAL DETECTIONS IN HUMANS BY SITE AND SPECIMEN TYPE.

VIRUS	VIRAL FAMILY/GENUS	# OF DETECTIONS	SITE	SPECIMEN TYPES
BETACORONAVIRUS 1 (OC43)	CORONAVIRUSES	2	LOEI HOSPITAL	NASOPHARYNGEAL SWAB, RECTAL SWAB
HUMAN CORONAVIRUS HKU1	CORONAVIRUSES	1	RATCHABURI	NASOPHARYNGEAL SWAB
DENGUE VIRUS	FLAVIVIRUSES	1	LOEI HOSPITAL	BLOOD (WHOLE)
ZIKA VIRUS	FLAVIVIRUSES	1	CHULALONGKORN HOSPITAL	URINE
INFLUENZA A	INFLUENZA VIRUSES	46	LOEI HOSPITAL	NASOPHARYNGEAL SWAB, RECTAL SWAB
INFLUENZA B	INFLUENZA VIRUSES	10	LOEI HOSPITAL	NASOPHARYNGEAL SWAB
HUMAN ENTEROVIRUS B	ENTEROVIRUSES	2	LOEI HOSPITAL	RECTAL SWAB
HUMAN PARAINFLUENZA VIRUS 1	PARAMYXOVIRUSES	9	LOEI HOSPITAL	NASOPHARYNGEAL SWAB, RECTAL SWAB
MEASLES VIRUS	PARAMYXOVIRUSES	2	LOEI HOSPITAL	NASOPHARYNGEAL SWAB, RECTAL SWAB

VIRUS TABLE

VIRAL FAMILY	VIRUS	SPECIES	SAMPLING LOCATION	# OF POSITIVE INDIVIDUALS		
				TOTAL	WET SEASON	DRY SEASON
Coronavirus	Betacoronavirus 1 (OC43)	Human	Loei Hospital	1	0	1
	Human coronavirus HKU1	Human	Ratchaburi	1	0	1
	PREDICT_CoV-16	Indian Flying Fox, Lyle's Flying Fox	Chonburi	34	31	3
	PREDICT_CoV-17	Indian Flying Fox, Lyle's Flying Fox	Chonburi	88	77	11
	PREDICT_CoV-22	Dawn Bat	Khao Chakan	7	7	0
	PREDICT_CoV-24	Greater Short-Nosed Fruit Bat	Loei	1	0	1
	PREDICT_CoV-27	Large Asian Roundleaf Bat	Khao Chakan	3	3	0
	PREDICT_CoV-41	Wrinkle-Lipped Free-Tailed Bat	Ratchaburi	1	1	0
	PREDICT_CoV-47	Wrinkle-Lipped Free-Tailed Bat	Khao Chakan, Loei, Ratchaburi	19	5	14
	PREDICT_CoV-56	Greater Short-Nosed Fruit Bat	Loei	1	0	1
	PREDICT_CoV-68	Indian Flying Fox, Lyle's Flying Fox	Chonburi	13	13	0
	PREDICT_CoV-82	Wrinkle-Lipped Free-Tailed Bat	Khao Chakan, Loei, Ratchaburi	42	40	2
	PREDICT_CoV-99	Wrinkle-Lipped Free-Tailed Bat	Ratchaburi	16	2	14
	Bat coronavirus 1	Schreiber's Long-Fingered Bat, Western Long-Fingered Bat	Khao Chakan, Loei	3	3	0
	Bat coronavirus HKU10	Large Asian Roundleaf Bat	Khao Chakan	4	4	0
	Porcine epidemic diarrhea virus	Horsfield's Myotis	Khao Chakan	1	1	0
	Rousettus bat coronavirus GCCDC1/346/356	Dawn Bat	Loei	1	1	0
	Longquan Aa mouse coronavirus	Bower's Rat	Loei	1	0	1
	Murine coronavirus	Cook's Mouse, Fawn-Coloured Mouse, Indomalayan Niviventer, Neill's Long-Tailed Giant Rat, Oriental House Rat, Polynesian Rat, Red Spiny Rat	Loei, Ratchaburi	36	28	8
	Betacoronavirus 1 (Bovine CoV)	Domestic Cow	Ratchaburi	1	1	0
Paramyxovirus	Human parainfluenzavirus 1	Human	Loei Hospital	8	2	6
	Measles virus	Human	Loei Hospital	1	0	1
	PREDICT_PMV-2	Lyle's Flying Fox	Chonburi	4	4	0
	PREDICT_PMV-3	Lyle's Flying Fox	Chonburi	2	1	1
	PREDICT_PMV-4	Indian Flying Fox	Chonburi	1	0	1
	PREDICT_PMV-5	Lyle's Flying Fox	Chonburi	5	4	1
	PREDICT_PMV-6	Lyle's Flying Fox	Chonburi	4	3	1
	PREDICT_PMV-10	Indian Flying Fox, Lyle's Flying Fox	Chonburi	2	0	2
	PREDICT_PMV-85	Lyle's Flying Fox	Chonburi	1	1	0
	PREDICT_PMV-125	Indian Flying Fox	Chonburi	1	1	0
	PREDICT_PMV-128	Lyle's Flying Fox	Chonburi	2	2	0
	PREDICT_PMV-140	Lyle's Flying Fox	Chonburi	1	1	0
	PREDICT_PMV-142	Lyle's Flying Fox	Chonburi	1	0	1
	PREDICT_PMV-155	Wrinkle-Lipped Free-Tailed Bat	Loei, Ratchaburi	9	9	0
	Nipah virus	Lyle's Flying Fox	Chonburi	6	6	0
	PREDICT_PMV-20	Polynesian Rat	Loei	2	0	2
	PREDICT_PMV-86	Lesser Ricefield Rat, Polynesian Rat	Loei	3	3	0
	PREDICT_PMV-159	Fawn-Coloured Mouse	Loei	1	1	0
Influenza virus	Influenza A	Human	Loei Hospital	38	32	6
	Influenza B	Human	Loei Hospital	10	7	3
Flavivirus	Dengue virus serotype 2	Human	Loei Hospital	1	1	0
	Zika virus	Human	Chulalongkorn Hospital	1	1	0
Picornavirus	Human enterovirus B	Human	Loei Hospital	2	0	2
Total				**380**	**296**	**84**

EPIDEMIOLOGICAL & BEHAVIORAL RISK

The PREDICT team assessed zoonotic disease risk using a multi-pronged approach, which included analysis of ecological wildlife-human interfaces, epidemiological risk based on viral detection data in wildlife, scenario and spatial modeling, and quantitative analysis of behavioral survey data.

The PREDICT project's risk-based approach to surveillance included targeted wildlife sampling from key animal-human interfaces at each sampling site. Overall, the highest rate of viral detections at these disease interfaces for coronaviruses and paramyxoviruses in animals occurred around human dwellings. A high percentage of coronavirus positive individuals were also sampled in the market value chain, although with more limited sampling in this setting. While the total number of coronavirus detections was relatively low in the extractive industry setting, including bat guano mining from Ratchaburi Province, this interface was important given the high level of exposure to animal excreta and the types of viruses discovered (MERS-related CoVs).

	Coronaviruses	Filoviruses	Flaviviruses	Influenzas	Paramyxoviruses
dwellings	5.2% (3702)	0% (2432)	0% (2406)	0% (2432)	1.2% (2532)
dwellings; natural areas	12.6% (87)	0% (58)	0% (55)	0% (58)	0% (58)
extractive industry	1.6% (2415)	0% (1610)	0% (1610)	0% (1610)	0.4% (1610)
market and value chain	5.2% (174)	0% (118)	0% (101)	0% (118)	0% (118)
natural areas	3.4% (2227)	0% (1277)	0% (1266)	0% (1269)	0.2% (1277)

FIGURE 5. Heatmap summarizing sampling effort and detection of positives in wildlife for the five priority viral families by disease risk interfaces (e.g. market value chain, wildlife near human dwellings, etc.) at the sampling sites. Dwellings include rural, human inhabited sites in located in close proximity to wildlife populations, in some cases those sites geographically overlap with uninhabited natural areas.

MAPS & MODELS FOR THE THAILAND VIROME PROJECT PARTNERSHIPS

To further assess risk from the PREDICT project's surveillance data and viral findings, the PREDICT Thailand team, together with global PREDICT partners, combined viral detection data with epidemiological and ecological risk analyses. Analytical reports were generated directly from the EIDITH database and were shared with country teams throughout the project to help them better understand country and regional risk and contextualize their findings as new data came in. These analyses included geographic distribution of detected viruses, host range, viral discovery rates, comparison of risk factors across sites in a country, and prioritization of species and sites for future surveillance activities (e.g. for the Thailand Virome Project Partnership (TVPP)).

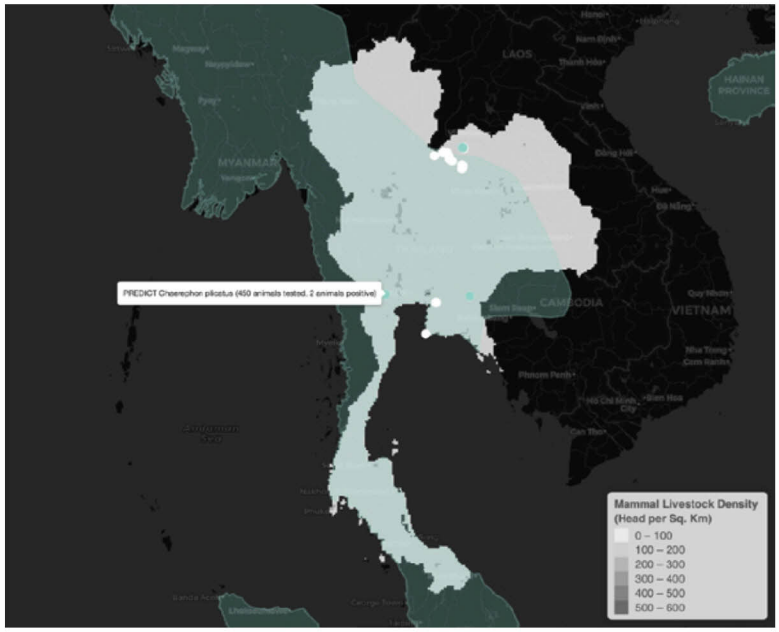


FIGURE 6. Output from the PREDICT Thailand Modeling & Analytics report showing viral data in a geographic context to explore risk assessments. Data shown here are for a novel coronavirus, PREDICT_CoV-47, with the known host species geographic range highlighted (green area) and sampling site data from PREDICT Thailand as white dots (PREDICT CoV-47 not detected) and green dots (virus was detected). Data overlaid with global data on mammal livestock density, grey-scale base layer (FAO Gridded Livestock of the World).

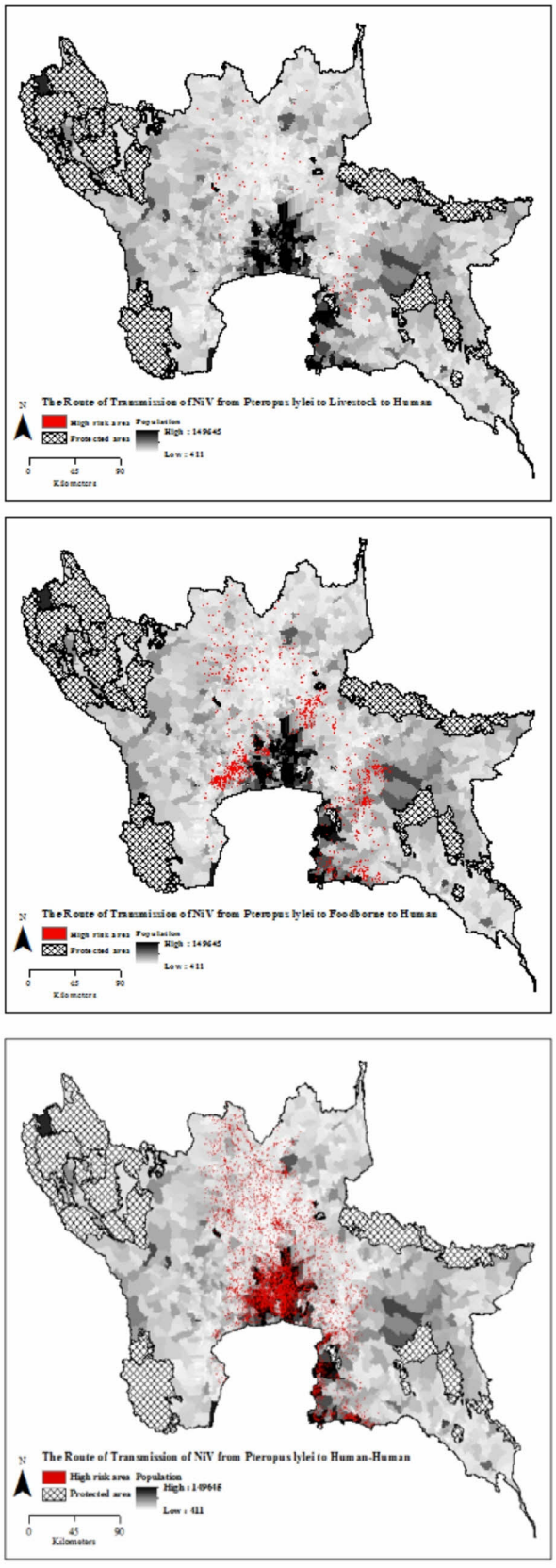


FIGURE 8. Analysis of Nipah virus spillover risk in Thailand using habitat suitability models of the primary bat host, Pteropus lylei, and spatial data for known drivers of virus spillover (e.g. pig density and presence of fruit orchards). Showing areas with a high risk of Nipah virus transmission from P. lylei to livestock (A), via foodborne (fruit orchard) sources (B), and directly to humans (C) in Thailand.

To further assess epidemiological risk from specific wildlife virus findings, we analyzed viral detection data for every virus detected by the PREDICT project in Thailand at least 30 times against various host, sampling, and ecological traits. Using a multi-variable Least Absolute Shrinkage and Selection Operator (Lasso) regression analysis, we were able to identify on the most significant variables that predict whether or not a given virus would be detected. PREDICT Thailand identified two newly discovered coronaviruses (with an unknown ability to infect people), PREDICT_CoV-17 and PREDICT_CoV-82, from 89 and 42 different animals, respectively. PREDICT_CoV-17 was found frequently in *Pteropus* spp. (large fruit bats) from Chonburi Province (Fig. 7), and PREDICT_CoV-82 was found in *Chaerephon plicatus* (cave roosting insectivorous bat) from Ratchaburi Province. Interestingly, the most important predictor for detecting both of these viruses was sampling juvenile bats. This finding, that the age structure of wildlife populations is an important risk factor, was also noted for coronaviruses in East Africa (Montecino-Latorre et al. 2020), and in global analyses for other viruses.

Nipah virus represents a clear and present threat, as it has been discovered to be circulating widely in bat populations in Thailand but has not yet been found in pig or human populations that interact with bat populations. The PREDICT team supported critical investigations into the natural ecology of Nipah virus in bats, and the risk posed to local communities living in close contact with bat populations. As part of the effort to further strengthen the capacity for zoonotic disease risk modeling in Thailand, Ms. Aingorn "Na" Chaiyes, a PhD student and member of the PREDICT team in Thailand, completed a Modeling & Analytics fellowship with EcoHealth Alliance in New York for 5 weeks in 2016. Ms. Chaiyes' PhD research focused on using ecological niche modeling and spatial analyses tools to better understand the risk of Nipah virus spillover across Thailand. This research resulted in two peer-reviewed publications, one published and one currently in review.

FIGURE 7. Heatplot of PREDICT_CoV-17 prevalence by sampling season and sex of bats sampled. PREDICT_CoV-17 was detected 89 times in *Pteropus* spp. (flying foxes) from Chonburi Province. No differences in prevalence were observed between male and female bats, but significantly higher prevalence was detected in wet season vs. dry season, which is likely related to the abundance of juvenile bats.

IN-DEPTH BEHAVIORAL RISK INTERVIEWS

In Thailand, behavioral risk questionnaires were administered to community members enrolled in our community virus surveillance. This included 243 participants from the concurrent (wildlife, people, domestic animals) sampling site in Chonburi Province, and 230 participants from the concurrent sampling site in Ratchaburi Province. In addition, 200 participants from Loei Province enrolled in the clinic-based surveillance were also surveyed. Some key differences in each setting were observed with implications for the frequency of animal contacts and associated risk of exposure to zoonotic pathogens, as well as other differences such as hygiene practices, health-seeking behavior, and knowledge about zoonotic risk.

In Loei Province, a more rural setting bordering mountainous areas, there was a high degree of contact with live animals in and around the home, including with rodents, and 39.5% of participants reported eating undercooked or raw meat and organs from animals. We also analyzed the specific types of contact with each wildlife taxonomic group (bats, rodents, and primates) from each site. For example, in Loei Province, 27% of participants noted rodents around their homes and 8% have slaughtered rodents for food (Figure 9). In Ratchaburi Province, relatively few individuals have knowingly or directly interacted with bats, but a few individuals did acknowledge being bitten or scratched recently. These behaviors overlap in an area where we also detected a variety of rodent-borne coronaviruses and paramyxoviruses but did not find evidence of human infection with these viruses.

There appeared to be a lack of general consensus on whether live animal markets could be cause for concern, with respondents in Chonburi and Loei being split evenly on the risk that these sites presented (with 49% and 52%, respectively, indicating that "Yes," they were worried about diseases in live animals in markets), and respondents in Ratchaburi being just slightly more concerned than not (58%). Knowledge of the risk of zoonotic disease was somewhat limited, with between 18-46% of participants (depending on site) acknowledging that slaughtering or butchering animals with an open would could lead to disease infection. 21% and 33% of respondents in Chonburi and Loei, respectively, indicated that they did not know if there were associated dangers in this case, and 66% of respondents in Ratchaburi reported that there would be nothing to worry about. These responses, which acknowledge uncertainty and indicate misinformation, suggest potential entry points for targeted public health messaging and behavior change communication programming – particularly for those whose occupational or cultural activities center around live markets. The opportunity in Thailand to share new information and challenge existing beliefs is further reinforced when looking at the responses among those who had reported an unusual illness in the last year: the majority of respondents across each site admitted that they did not know the origins of their illness. Together, our preliminary findings suggest that some communities, including ones with high levels of animal contact, would make good targets for continued community engagement and education campaigns about zoonotic disease transmission.

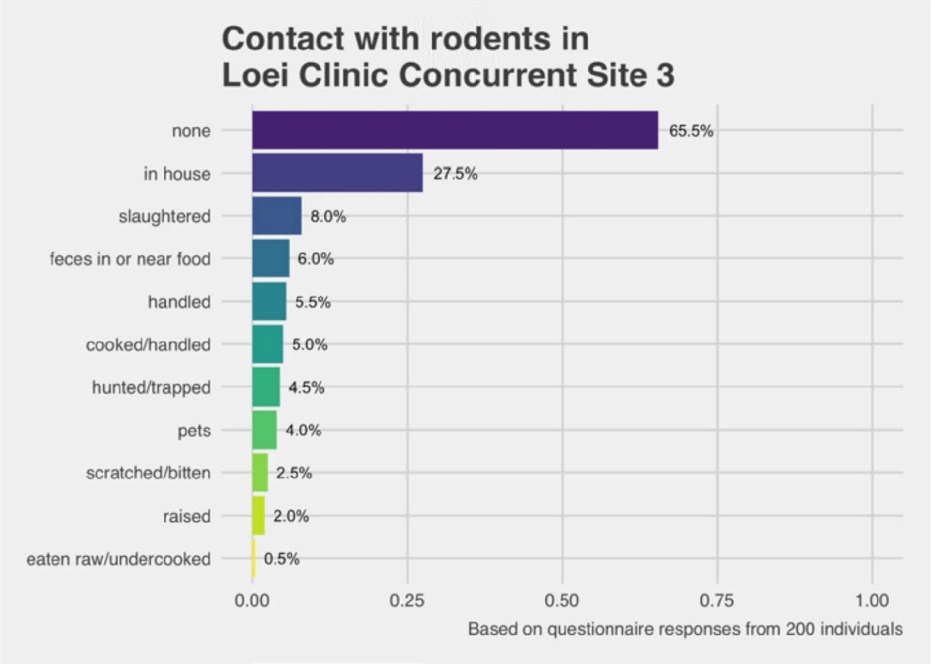


FIGURE 9. Reported human contact with rodents at various interfaces by participants from Loei Clinic.

COMMUNITY ENGAGEMENT & RISK COMMUNICATION

The PREDICT team provided summaries of surveillance and laboratory findings to the communities involved in the project. The team also shared resources and strategies with community partners designed to reduce risks for virus transmission while balancing health and conservation goals. In Ratchaburi Province, the PREDICT team conducted community outreach campaigns targeting the bat guano miner community to increase awareness and promote risk reduction strategies. The PREDICT-developed risk reduction and behavior change communication resource *Living Safely with Bats* was translated into Thai language and used to highlight ways that communities can live safely and humanely in concert with bats. More than 100 participants learned about bats, their important contributions to ecosystem services, and strategies that could reduce the risk of spillover, amplification, and spread of novel viruses. The PREDICT team also organized a "Community One Health Meeting" for villagers within Panatnikhom District, Chonburi Province on November 28, 2018 to educate them on the zoonotic diseases carried by bats and dogs. Other examples of community engagement include organizing the "Global One Health Day" in 2017 and 2018 with government partners from 7 One Health organizations and the "Disease X conference" to disseminate research findings to the academic and layman communities, held in Bangkok on December 17, 2018.

CAPACITY STRENGTHENING

The PREDICT team was host to a large number of One Health trainings and collaborative workshops aimed at increasing capacity for pre-emptive disease surveillance and detection across the country. These trainings ranged from field, laboratory topics, and policy level collaborations with government as well as researchers and health? professionals.

The PREDICT team conducted biosafety training in bat and rodent sampling for >50 local government staff from the Department of National Parks (DNP) who worked alongside PREDICT project staff in Loei and Ratchaburi Provinces in July 2016. The team also hosted two SEAOHUN (EPT One Health Workforce) fellows from Myanmar and Malaysia. Both individuals received training in biosafety and bat sampling.

The PREDICT project in Thailand made significant contributions to improving the capabilities of the national laboratory system in-country and in the greater Asia region by hosting workshops with FAO partners in viral detection methods and through numerous in-country events. In 2017, the team participated in the "Joint External Evaluation of IHR Core Capacity in Thailand" meeting held at the MOPH. PREDICT project protocols for broad viral screening at a family level were suggested as an alternative method to detect viruses with zoonotic potential to the committee, and examples were given to show how these new tools have been implemented in Thailand at Chulalongkorn and DLD laboratories.

The PREDICT team conducted biosafety training in bat and rodent sampling for local DNP staff involved with the PREDICT project at Loei Province on July 18, 2016. (Photo credit: PREDICT/Thailand)

PREDICT collaborated with the Department of Disease Control, MOPH to strengthen influenza surveillance and reporting. These efforts were specifically directed towards improving the national influenza reporting system by strengthening the capacity of diagnostic laboratories at the regional level. The PREDICT team organized a hands-on training workshop, sponsored by the National Science and Technology Development Agency of Thailand, on real-time PCR diagnostics for influenza virus infection from human specimens. The workshop was organized for 14 laboratories from the Department of Disease Control in March 2017. Following the training, the PREDICT team participated in a meeting organized by the Department of Disease Control and provided expert advice on database development for influenza surveillance in Thailand.

The PREDICT project in Thailand, together with PREDICT global partners, conducted training workshops for staff from Loei hospital and the Ratchaburi Office of Disease Prevention and Control on quantitative and qualitative methods for behavioral risk surveillance and intervention development. The multi-day training involved hands-on exercises in behavioral survey collection and qualitative research, and ethical considerations for human subject research.

OUTBREAK PREPAREDNESS & RESPONSE

Due to its abundant experience diagnosing emerging viruses over the past 10 years, PREDICT Thailand's laboratory has been designated as the Ministry of Public Health's reference laboratory for identification of EIDs. At the request of the Thai Ministry of Public Health (MOPH), the PREDICT team provided technical assistance for viral detection during several noteworthy infectious disease investigations. The first imported MERS case in Thailand, in 2015, was identified and confirmed by the PREDICT lab team within 24 hours after receiving the specimen. Contact tracing was implemented immediately, and known contacts were placed in self-isolation for 14 days, including air-crew, and no outbreak occurred. During the Ebola outbreak in Africa in 2014, a PREDICT protocol was used to test human samples from suspected imported cases in Thailand during the first few months when the standard diagnostic assay was not available in country. In January 2020, the PREDICT team also detected the first human COVID-19 case in-country (see Special Features below).

In partnership with the government Department of National Parks, Wildlife and Plant Conservation (DNP), the PREDICT team also investigated the cause of death of more than 1,000 bats in Kanchanaburi Province in November 2015. As part of the investigation, the team sampled more than 53 bats in the field and tested the samples for the presence of viral RNA from six viral families at the project laboratory including corona-, paramyxo-, influenza, lyssa-, rhabdo-, and filoviruses (additional funding for laboratory assays was provided by FAO). Seven coronaviruses in fecal samples and four paramyxoviruses in urine specimens were identified; these results were confirmed by genetic sequencing. There is no evidence at this time to suggest these viruses pose a threat to human health or caused the bat die-off. All results were reported to government partners as part of the surveillance and outbreak investigation. It was concluded that the mortality event was likely due to weather (flooding within the cave) and not a viral pathogen.

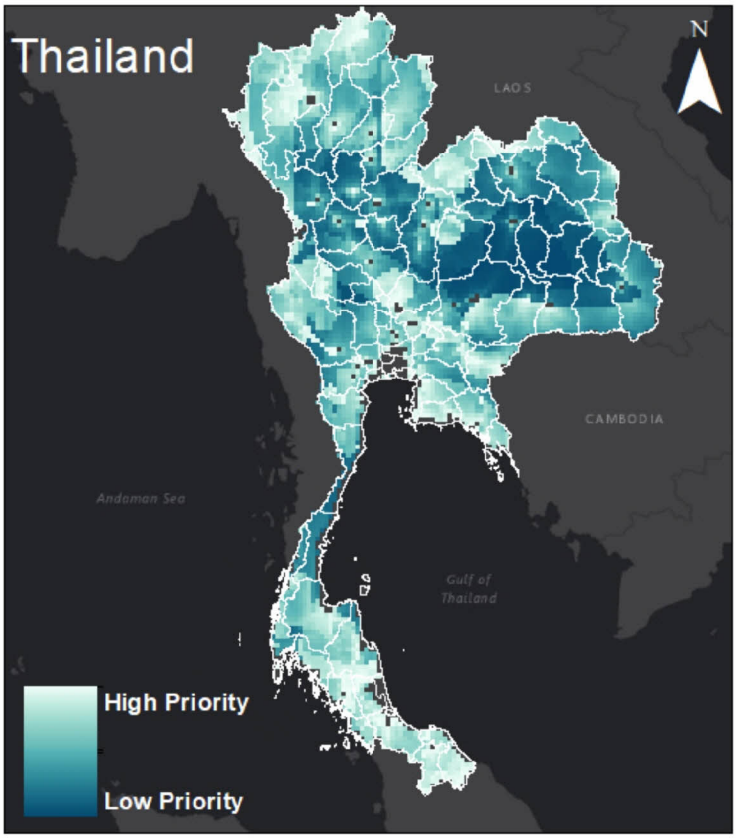
Bat carcasses were sampled by the PREDICT Team in Nam's cave, Kanchanaburi Province, during an investigation into the cause of death of over 1,000 bats with partners at the Department of National Parks. (Photo credit: PREDICT/Thailand)

ADVOCATING FOR A GLOBAL VIROME PROJECT

On January 31st, 2017, the PREDICT team hosted a Global Virome Project (GVP) seminar at Chulalongkorn University Hospital. The seminar was part of broader efforts to garner interest in the GVP and Emerging Pandemic Threats (EPT) projects, as well as zoonotic pathogens and emerging infectious disease in Thailand. On January 29, 2018, during the Prince Mahidol Award Conference (PMAC) in Bangkok, Thailand, the PREDICT Project and the Global Virome Project (GVP) planned and successfully hosted a meeting titled "Introducing the Global Virome Project". This was the second global in-person GVP meeting following from the kick-off meeting in Beijing, China.

To set the stage for GVP, the PREDICT project contributed to the predicted viral diversity and costs of viral discovery analyses, recently published in Science. Building on this work, the PREDICT team developed a spatial modeling approach to identify priority sites for optimal viral sampling in wildlife at a 10 x 10 km resolution in countries around the world.

The first country with a completed, new GVP site selection analysis was Thailand, in preparation for a Thailand National Virome Project (also known as the Thailand Virome Project Partnership - TVPP) workshop held in Bangkok in October 2018, where the findings were presented to Thai government stakeholders. The TVPP is currently developing its research activities and is in a pilot program phase under guidance from the wildlife sector at the Department of National Parks (DNP). At present, DNP is collaborating with the PREDICT Thailand team to conduct virus testing from wildlife specimens as a pilot for the TVPP at high priority locations.



Future sampling priority areas in Thailand, ranked from most optimal (white) to least optimal (dark blue). Data analysis was conducted for the Thailand Virome Project Partnership planning meetings, including the development of interactive scalable maps. We used the Zonation Conservation Planning Software to select and rank sites of highest sampling value based on the number of unique zoonotic viruses predicted to occupy each grid cell (derived from Olival et al. 2017) and the relative cost of accessing each site from nearby cities of greater than 50,000 people (Weiss et al. 2018). We identified optimal areas for viral sampling using a decision support system for spatial planning that allocates resources (e.g. sampling costs) and prioritizes areas. The result is a ranking of all potential sampling sites in Thailand based on the highest return on investment for sampling in a particular area.

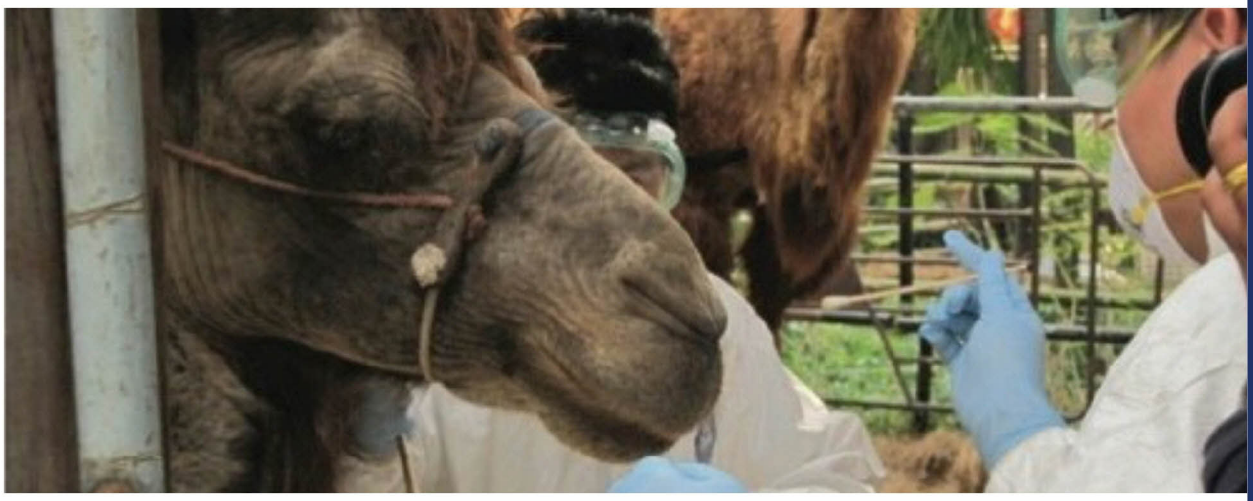
THAM LUANG CAVE RESCUE

The PREDICT team played a key role during the rescue of the boys trapped in the Tham Luang cave in July 2018, which was a multinational and collaborative effort in the global spotlight. PREDICT supported the Thai Ministry of Public Health in testing samples from the 13 survivors for diseases. Being trapped in a cave without any access to food or clean water might have compromised the immune system of the boys, increasing their susceptibility to bacterial, fungal, viral or other infections including potential bat, rodent, or insect-transmitted pathogens from the environment. PREDICT PCR diagnostic protocols were used to broadly screen for known and unknown viruses, and testing results were shared in real-time with a network of public health laboratories in Thailand. Fortunately, none of the rescued young soccer players tested positive for any pathogens related to their time in the cave.

On June 23, 2018, twelve boys from the Wild Boars soccer team and their coach set out on an adventure to explore the vast Tham Luang Nang Non cave complex ("The Great Cave of the Sleeping Lady"), near the village of Pong Pa in northern Thailand. But due to the rapid onset of monsoon rains, caverns in the cave began to flood and the team became trapped in deep caverns, separated from the entrance by miles of flooded chambers. The boys were trapped and missing for nine days before specialist rescue divers located them. Then another nine days passed before all 12 boys and their coach were rescued from the cave by the divers in a massive operation that involved more than 10,000 people, miles of hose and rope, pumps, generators, and countless supporters. The collaborative rescue was a multi-national and interdisciplinary success, and even featured One Health expertise, as the PREDICT partner laboratory at Chulalongkorn University was requested by the Thai government and the Ministry of Public Health (MOPH) to provide technical assistance with disease screening following the team's rescue.

Following the rescue, as the soccer team members were carefully monitored by health experts, PREDICT's lab team provided advice to MOPH staff on safe collection of specimens for viral screening, and then prepared to test the specimens for infectious pathogens. The PREDICT project's sampling protocols were used to collect the samples and our project's viral detection protocols, which can identify both known and emerging viral threats, were used for screening. In addition to testing at our PREDICT lab, specimens were also shared with One Health network laboratories, including the Department of Medical Sciences, Thai and US Armed Forces Research Institute of Medical Sciences, and the Department of Microbiology and Parasitology, Faculty of Medicine, Chulalongkorn University. Lab teams simultaneously ran specific assays for targeted diseases along with the PREDICT project's family-wide viral detection assays to ensure results within 24 hours.

The exhaustive disease screening following the cave rescue demonstrate Thailand's proactive approach surveillance and response, especially for emerging diseases and disease risks from bats and caves. In addition, the strengths of the national laboratory system were prominent, as Thailand's disease detection network successfully collaborated to share data and information for rapid detection and identification of disease threats.



MERS-CoV PREPAREDNESS & EARLY DETECTION

The Middle East Respiratory Syndrome Coronavirus (MERS-CoV), caused by a coronavirus, is an emerging infectious disease that was first detected in 2012. MERS-CoV is thought to have an animal source with an ancestral origin in bats and contemporary transmission from camels to people in the Middle East. Infection may also be transmitted between humans through airborne spread or direct contact, and several outbreaks have occurred around the world from imported human cases. In June 2015, Thailand saw its first case of MERS-CoV, brought into the country by an international traveler.

As a result of prior preparedness efforts, including viral discovery for human infections as part of the PREDICT project, training on sampling for potential MERS-CoV infections, and MERS-CoV laboratory screening protocols, the country had strong capacities in place. Paired with infection control practices, intensive surveillance was rapidly implemented (e.g. temperature checks) in high-risk settings including points of entry into the country and in healthcare settings. Suspected MERS-CoV patient samples were rapidly tested (only seven hours for first results and 24 hours for confirmation) at the WHO Collaborating Center for Research and Training on Viral Zoonoses at Thailand's Chulalongkorn University (which reports to the Ministry of Health). The PREDICT team tested hundreds of potential contacts identified via contact tracing by the Ministry of Public Health from several separate MERS-CoV introductions. No secondary infections were detected in Thailand suggesting no human to human transmission occurred.

Given the limited knowledge on MERS-CoV when it first emerged, the PREDICT team leveraged its ongoing wildlife surveillance efforts with One Health partners to continue to test for coronaviruses in wildlife and domestic animals in the country to help improve understanding about this group of viruses. At the request of the Government of Thailand, the PREDICT team also hosted a training on how to safely sample camels for MERS-CoV detection in February 2014. Surprisingly, there are over 50 camels in Thailand, located at various zoos and other captive facilities, and officials wanted to be sure there was no evidence for MERS-CoV infection in these captive animals. The Department of Livestock and Development followed up after the training with sampling and testing of camels in the country.

COVID-19 DETECTION IN THAILAND

The COVID-19 infection was first confirmed at the PREDICT lab at Chulalongkorn Hospital and PREDICT project viral family diagnostic protocols were used to detect and characterize the novel coronavirus from a Wuhan tourist before the specific testing protocol from WHO was available. The finding and sequence confirmation (best matched to bat SARS-related coronavirus, accessed to GenBank on January 9, 2020) was reported to MOPH within 24 hours after receiving the specimen. On January 11st, 2020 the sequence was re-analyzed with the first whole genome sequence of SARS-CoV-2 from China, the two viruses were found to be identical for a short region of the genome. The whole genome was then characterized using next-generation sequencing technology and was found to be >99% identical to SARS-CoV-2 from Wuhan.

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5. Artit Sangkakam PH, Abhinbhen W Saraya, Benjamard Thaweethee-Sukjai, Thaniwan Cheun-Arom, Alice Latinne, Kevin J Olival, Supaporn Wacharapluesadee Detection of influenza virus in rectal swabs of patients admitted in hospital for febrile illnesses in Thailand. SAGE OPEN MEDICINE. In reivew;In review.
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Sent: Thu, 3 Sep 2020 10:51:47 -0700
Subject: Re: OHAC Call #23
From: Jonna Mazet <jkmazet@ucdavis.edu>
To: "Minicucci, Charles" <CMinicucci@nas.edu>
Cc: Amy Pruden <apruden@vt.edu>, "andre@ecohealthalliance.org" <andre@ecohealthalliance.org>, "Barton Behravesh, Casey (CDC/OID/NCEZID)" <dlx9@cdc.gov>, "daszak@ecohealthalliance.org" <daszak@ecohealthalliance.org>, David Rizzo <dmrizzo@ucdavis.edu>, [redacted], Geraldine Neville <gneville@tulane.edu>, "Hermsen, Elizabeth D" <elizabeth.hermsen@merck.com>, "Hughes, James M" <jmhughe@emory.edu>, John Parrish-Sprowl <johparri@iupui.edu>, "kevin.anderson@dhs.gov" <kevin.anderson@dhs.gov>, Mary Radford <maradford@ucdavis.edu>, Mary Wilson <mary_wilson@harvard.edu>, "mewilson@hsph.harvard.edu" <mewilson@hsph.harvard.edu>, "Miller, Sally" <miller.769@osu.edu>, "mlichtve@tulane.edu" <mlichtve@tulane.edu>, "MUMFORD, Elizabeth" <mumforde@who.int>, "Rushton, Jonathan" <[redacted]>, "Pavlin, Julie" <JPavlin@nas.edu>, "Thevenon, Audrey" <AThevenon@nas.edu>, "Goodtree, Hannah" <HGoodtree@nas.edu>, "Berger, Kavita" <KBerger@nas.edu>, "Sylvina, Teresa" <TSylvina@nas.edu>
FMT One Health SOT 7.12.2020.docx

Thanks for the call today,
Next FMT workshop scope attached.
Have a nice day,
Jonna

On Thu, Aug 27, 2020 at 6:37 AM Minicucci, Charles <CMinicucci@nas.edu> wrote:

Hello all,

Please find attached to this calendar update the agenda for the call and some results illustrations from the One Health workers survey, which Jonna will discuss during the meeting. We will also be joined by three prospective collaborators from other areas of NASEM: Kavita Berger, the new director of the Board on Life Sciences; Teresa Sylvina, the director of the Strategic Initiatives for Animal Research; and Audrey Thevenon, who is heading up a new rapid strategic science initiative for COVID-19 response.

See you all next week! Thanks,

Charlie

Join from PC, Mac, Linux, iOS or Android:
[redacted]
Password: 0 [redacted]

Or iPhone one-tap :
US: +1 [redacted], [redacted] Or Telephone:
Dial(for higher quality, dial a number based on your current location):
US: +1 301 715 8592 or +1 312 626 6799 or +1 470 250 9358 or +1 646 518 9805 or +1 646 558 8656 or +1 651 372 8299 or +1 213 338 8477 or +1 253 215 8782 or +1 602 753 0140 or +1 669 219 2599 or +1 669 900 6833 or +1 720 928 9299 or +1 971 247 1195
Meeting ID: [redacted]
Password: [redacted]
International numbers available: [redacted]

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https://nasem.zoom.us/test

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Systematizing the One Health Approach in Preparedness and Response Efforts for Infectious Disease Outbreaks

STATEMENT OF TASK

A planning committee of the National Academies of Sciences, Engineering, and Medicine will organize a workshop to examine ways to systemize and integrate the One Health approach as part of outbreak prevention, detection, preparedness, and response efforts. The in-person workshop will explore research opportunities, multi-sectoral collaboration mechanisms, community engagement strategies, educational opportunities, and policies that can effectively implement the core capacities and interventions of One Health principles to strengthen national health systems and enhance global health security.

Specifically, the workshop will feature invited presentations and discussions on the following topics:

- Strategies to build a strong investment case to overcome political and technical impasses to systematize One Health in national prevention, detection, preparedness, and response efforts;
- Evaluation of One Health programs integrated into national and global public health efforts;
- Integration of animal and human health surveillance systems for cross-reporting to better understand pathogens in animals before (or after) spill-over to humans;
- Feasibility of introducing and integrating One Health into existing coordination mechanisms, and into national action plans based on the Joint External Evaluation;
- Strengthening the global health workforce with One Health capacities;
- Policies that underscore the interconnectedness of animal, human, and environmental health;
- Implications of using a One Health approach to improve preparedness vs. a reactionary response that is required to create medical countermeasures after outbreak onset;
- Best practices for engaging with communities and influencing behaviors that lower the risk of infectious disease infection through the One Health approach;
- The tension between public health needs, the private sector and data sharing within the One Health context in preparedness and response efforts; and
- Potential priority actions to unite organizations – public and private, domestic and international – in efforts to overcome newly discovered hurdles based on lessons learned from the COVID-19 pandemic.

Speakers and discussants will contribute perspectives from government, academia, private, and nonprofit sectors. The planning committee will organize the workshop, select and invite speakers and discussants, and moderate the discussions. A

proceedings of the presentations and discussions will be prepared by a designated rapporteur in accordance with institutional guidelines.

Sent: Thu, 3 Sep 2020 12:09:46 -0700
Subject: Re: GVP & Predict twitter accounts both suspended right now.
From: Jonna Mazet <jkmazet@ucdavis.edu>
To: Eunah Cho Preston <eecho@ucdavis.edu>
Cc: Matthew Blake <mblake@ucdavis.edu>, Zoe Grange <[REDACTED]>

Thanks very much & fingers crossed,
Jonna

On Wed, Sep 2, 2020 at 11:17 PM Eunah Cho Preston <eecho@ucdavis.edu> wrote:

> So I put out a call for Twitter connections on Facebook tonight and Pranav just messaged me saying his sister-in-law works for Twitter HQ.

He's asked her to help and she says she'll look into the reasons for suspension and try to get our accounts restored. Keep those fingers crossed!

From: Matthew Blake <mblake@ucdavis.edu>
Sent: Wednesday, September 2, 2020 11:14:14 PM
To: Eunah Cho Preston <eecho@ucdavis.edu>; Jonna Mazet <jkmazet@ucdavis.edu>; Zoe Grange <[REDACTED]>
Subject: Re: GVP & Predict twitter accounts both suspended right now.

My suspicion is that the suspensions are actually due to some flagging or reporting of false abuse (or similar) from the same "conspiracy people" to which Peter refers. It's been months for PREDICT now, with nothing but BS from Twitter.

If Robert Kessler has ideas and influence, I say let him have at it. At the least, it will show Peter that the suspensions are not due to funding issues, liability issues, incompetence, or anything other than Twitter locking us out and not responding to requests to let us back in. At best, Robert can get us back online with those accounts using some magic or pestering we have not tried.

If we do give him access, let's change passwords first, please.

Thanks,
Matt

From: Eunah Preston <eecho@ucdavis.edu>
Date: Wednesday, September 2, 2020 at 10:42 PM
To: Jonna Mazet <jkmazet@ucdavis.edu>, Matthew Blake <mblake@ucdavis.edu>, Zoe Grange <[REDACTED]>
Subject: Re: GVP & Predict twitter accounts both suspended right now.

We've submitted multiple requests (our own @OneHealthLab account has also been suspended)—but as far as I'm aware they haven't listed any specific reasons for the suspension.

Frustratingly if we send another request it says our cases are active (assuming that means currently under review) but it's

been months with no updates. I suspect it may be related to security issues (potentially with multiple people logging into the same account) but not sure.

If anyone has a friend of a friend with a connection at Twitter, that might speed the process up? I've been tagging @TwitterSupport directly—in my most recent requests to un-suspend the accounts I've referenced the PREDICT mentions by Biden/Kamala. Maybe the name dropping will help...

Best,

Eunah

From: Jonna Mazet <jkmazet@ucdavis.edu>
Sent: Wednesday, September 2, 2020 9:49:50 PM
To: Eunah Cho Preston <eecho@ucdavis.edu>; Matthew Blake <mblake@ucdavis.edu>; Zoe Grange
Su [REDACTED] edict twitter accounts both suspended right now.

Can we fix?
J

---------- Forwarded message ---------
From: **Peter Daszak** <daszak@ecohealthalliance.org>
Date: Wed, Sep 2, 2020 at 8:31 PM
Subject: GVP & Predict twitter accounts both suspended right now
Christine Kreuder (ckjohnson@ucdavis.edu) <ckjohnson@ucdavis.edu>, Robert Kessler <kessler@ecohealthalliance.org>

I'm assuming you know about this but right now both @Globalvirome and @Predictproject are suspended by Twitter. Can Robert Kessler help work with you and Twitter to get them both back up and functioning? If this is some funding issue or some liability issue with UCD, we can host them or put them onto a single person's name.

releasing pandemic viruses. It would be really good to get them back up so we don't create a story out of nothing.

Peter Daszak

President

EcoHealth Alliance

520 Eighth Avenue, Suite 1200

New York, NY 10018-6507

USA

Tel.: +1-212-380-4474

Website: www.ecohealthalliance.org

Twitter: @PeterDaszak

EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation

From: Robert Kessler <kessler@ecohealthalliance.org>
Sent: Thu, 3 Sep 2020 15:22:58 -0400
Subject: Re: GVP & Predict twitter accounts both suspended right now.
To: Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>, David Wolking <djwolking@ucdavis.edu>, "Johnson Christine Kreuder (ckjohnson@ucdavis.edu)" <ckjohnson@ucdavis.edu>, Eunah Regina Cho <eecho@ucdavis.edu>, Matt Blake <mblake@ucdavis.edu>

I have reached out to several personal contacts who work at Twitter and asked them to at least process the requests so that you can get some answers. If I had to guess I would say that there is potentially some very minor rule breach which is the reasoning for this. They can tend to get antsy when the email used for verification does not belong to the same domain as the organization's, for instance. However, it seems this isn't necessary as David appears to have gone for the same approach but I will let you know what I hear. It would be helpful to know what dialogue you're given when you log onto these accounts. If it's been suspended due to someone's reporting, that should be stated.

On Thu, Sep 3, 2020 at 3:17 PM Jonna Mazet <jkmazet@ucdavis.edu> wrote:

> Hi Peter,
> I think David and Eunah replied to you separately, but just to make sure to close the loop....
> There are no funding or other concerns. We've been trying to fix for months. My account was also suspended, but I was able to get it fixed, even though I'm not really using it.

Matt believes that the suspensions are actually due to some flagging or reporting of false abuse (or similar) from the same "conspiracy people" to which you refer. It's been months for PREDICT now, with nothing but BS from Twitter.

It's certainly not for lack of our trying to fix it! Eunah has submitted multiple requests (our own @OneHealthLab account has also been suspended)—but as far as we're aware they haven't listed any specific reasons for the suspension.

Frustratingly, if we send another request it says our cases are active (assuming that means currently under review) but it's been months with no updates. Eunah also suspects security issues. Pranav on our team says his sister-in-law works for Twitter HQ. He's asked her to help, and she says she'll look into the reasons for suspension and try to get our accounts restored. If Robert has contacts or ideas, we'd appreciate the help.

Thanks,
Jonna

On Wed, Sep 2, 2020 at 8:31 PM Peter Daszak <daszak@ecohealthalliance.org> wrote:

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>
> It's getting traction with the conspiracy people out there who, surprise surprise, believe this is something to do with us releasing pandemic viruses. It would be really good to get them back up so we don't create a story out of nothing.

Cheers,

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Twitter: @PeterDaszak

EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation

--

Robert Kessler
Communications Manager

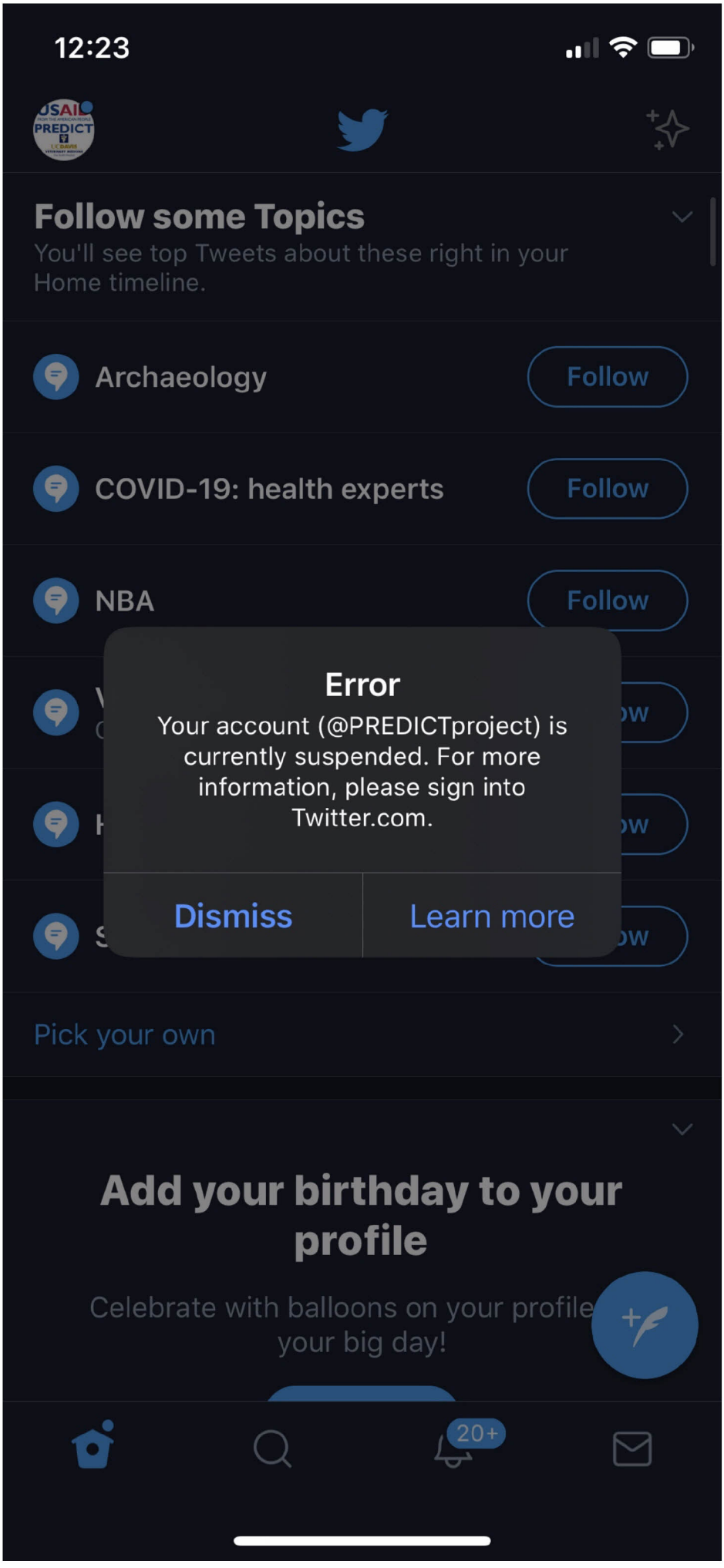
he/him

From: Eunah Cho Preston <eecho@ucdavis.edu>
To: Robert Kessler <kessler@ecohealthalliance.org>, Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>, David John Wolking <djwolking@ucdavis.edu>, Christine Kreuder Johnson <ckjohnson@UCDAVIS.EDU>, Matthew Blake <mblake@ucdavis.edu>
Subject: Re: GVP & Predict twitter accounts both suspended right now.
Sent: Thu, 3 Sep 2020 19:29:52 +0000

Thanks Robert. I'm attaching a screenshot of what it looks like when I try to log onto any of our suspended accounts. If you login directly you can see all content but it says there are 0 followers and 0 following. I'm not able to make any account changes until the account is unsuspended.

It doesn't look like specific tweets have been the reason for suspension so the supposed security breach is likely the reason (possibly from multiple people logging into the same accounts from different IP addresses).

Best,
E


12:23
Follow some Topics
You'll see top Tweets about these right in your Home timeline.
Archaeology
Follow
COVID-19: health experts
Follow
NBA
Follow
Error
Your account (@PREDICTproject) is currently suspended. For more information, please sign into Twitter.com.
Dismiss
Learn more
Pick your own
Add your birthday to your profile
Celebrate with balloons on your profile your big day!
20+

From: Robert Kessler <kessler@ecohealthalliance.org>
Sent: Thursday, September 3, 2020 12:22:58 PM
To: Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>; David John Wolking <djwolking@ucdavis.edu>; Christine Kreuder Johnson <ckjohnson@UCDAVIS.EDU>; Eunah Cho Preston <eecho@ucdavis.edu>; Matthew Blake <mblake@ucdavis.edu>
Subject: Re: GVP & Predict twitter accounts both suspended right now.

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Thanks,
Jonna

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> It's getting traction with the conspiracy people out there who, surprise surprise, believe this is something to do with us releasing pandemic viruses. It would be really good to get them back up so we don't create a story out of nothing.

Cheers,

Peter

Peter Daszak

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--

Robert Kessler
Communications Manager

he/him

REDACTED

REDACTED

EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.

From: [redacted]
To: Dennis Carroll [redacted], Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>
Subject: Re: EBP and GVP partnership
Sent: Wed, 30 Sep 2020 12:53:20 +0000

Hi Dennis,

Please can you send your feedback and/or signed documents for the EBP/GVP MOU.

Cheers,

[redacted]

From: [redacted]
Date: Thursday, September 24, 2020 at 4:59 PM
To: Dennis Carroll [redacted], Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>
Subject: EBP and GVP partnership

Hi Dennis,

Please find attached the Earth Biogenome Project MOU for your review signature. As stated in the MOU, this does not form a legally binding agreement and is a collaboration. They also require a letter of intent. I have drafted my response and kept it relatively generic but could use your input on content in particular for the GVP capabilities section.

Please contact me if you have any questions. Ideally we need a very quick turnaround as EBP we have already missed their deadline.

Cheers,

[redacted]

Sent: Wed, 30 Sep 2020 09:07:58 -0400
From: Dennis Carroll [redacted]
Subject: RE: EBP and GVP partnership
To: [redacted] Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>

Zoe, its unclear where I sign. There is no line for GVP among the signatures. Gudiance, please

d

Sent from Mail for Windows 10

From: REDACTED
Sent: Thursday, September 24, 2020 11:59 AM
To: Dennis Carroll; Jonna Mazet
Cc: Peter Daszak
Subject: EBP and GVP partnership

Hi Dennis,

Please find attached the Earth Biogenome Project MOU for your review signature. As stated in the MOU, this does not form a legally binding agreement and is a collaboration. They also require a letter of intent. I have drafted my response and kept it relatively generic but could use your input on content in particular for the GVP capabilities section.

Please contact me if you have any questions. Ideally we need a very quick turnaround as EBP we have already missed their deadline.

Cheers,

REDACTED

From: Cara Chrisman <cchrisman@usaid.gov>
Sent: Thu, 5 Jan 2017 10:55:18 -0500
Subject: Today's GVP Call - Agenda + Background Info
To: Jonna Mazet <jkmazet@ucdavis.edu>, Peter Daszak <daszak@ecohealthalliance.org>, Eddy Rubin <erubin@metabiota.com>, Dennis Carroll <dcarroll@usaid.gov>, Brooke Watson <watson@ecohealthalliance.org>, Elizabeth S Chase <eschase@ucdavis.edu>
Cc: Nathan Wolfe <nwolfe@metabiota.com>, Alison Andre <andre@ecohealthalliance.org>, Taylor Elnicki <telnicki@metabiota.com>, Rebecca Benmahdi <rbenmahdi@metabiota.com>, Katherine Leasure <kaleasure@ucdavis.edu>, Cassandra Louis Duthil <clouisduthil@usaid.gov>
EigenBioPlatform.pdf

Hi All,

Happy New Year! Looking forward to speaking at our regular time today. Our understanding is that Nathan will not participate today and that Jonna has a conflict and will likely join late or depart early.

Please see below the agenda below, as well as some background information.

Best,
Cara

Agenda

1. SF
2. Beijing
   - WG prep
   - CBD follow up
   - WT working group on sample collection etc
3. Pitch Deck
   - eco-zone modelling
   - sample sizes vs $$
4. Paper
5. Managing requests
6. As the Virome Turns

Background for Item #5

---------- Forwarded message ----------
From: **Jane Homan** <jane_homan@eigenbio.com>
Date: Tue, Jan 3, 2017 at 11:12 PM
Subject: Immunomes for the Global Virome
To: "dcarroll@usaid.gov" <dcarroll@usaid.gov>

Dear Dr. Carroll:

Thanks to an article published recently in STAT, I spent a bit of time over the holidays learning a little about the effort you are spearheading to "characterize all viruses". Exciting and far sighted. The question is "then what?"…

I believe that applied math technology we have developed at EigenBio may be an asset that can complement this effort, and also provide a bridge to understanding possible pathogenicity and development of interventions, as needed.

Briefly, we work in computational immunology and have developed a high throughput platform that allows us to rapidly characterize and integrate many facets of the immunome of individual proteins and of whole microbial proteomes. This allows us to identify epitopes of relevance to vaccine and diagnostic development, and also to evaluate which may be potential immunosuppressive motifs contributing to immune evasion, virulence, and epitope cross reactivity. We have worked with a wide range of pathogen protcomes (viral, bacterial, parasitic) as well as cancer neoantigens, autoimmune diseases, and biopharmaceuticals. In looking at large datasets of viruses (influenza, flaviviruses, HPV as examples), our analysis has provided some interesting insights into possible drivers of pathogenesis. It has also given us an appreciation of "epitope ecosystems" and possible consequences of disruption.We currently have work on going with DTRA on bacteria of interest.

While the genesis of our programs was for design of recombinant proteins, my own interest and prior experience is in epidemiology; as a veterinarian with extensive international experience, I'd love the chance to put our programs to work in the big data molecular epidemiology mission you have embarked on.

The input to our algorithms for each protein is simply amino acid fastas, so in essence as soon as a sequence is available, we can begin to characterize the organism and provide information on potential approaches to intervention. The concept of hundreds of thousands of viruses really doesn't phase us!

I have attached a very short general overview. I would be interested in learning more about the project scope and discussing how we might contribute as you move forward. Are you available for a telephone call? If a face to face meeting (and demo!) is appropriate I will likely be in DC the second week of Feb for a DTRA meeting, otherwise I'd be happy to show you what we have via a webinar.

Kind regards

Jane Homan

****

Jane Homan, PhD, MRCVS
Chief Executive Officer
EigenBio LLC
3591 Anderson Street, Suite 218
Madison, WI 53704
Tel: 608 310 9540
Fax: 608 310 9544

jane_homan@eigenbio.com

jane_homan@iogenetics.com
www.iogenetics.com
www.eigenbio.com

****

Cara J. Chrisman, PhD
Senior Infectious Diseases Technical Advisor
Emerging Threats Division
Office of Infectious Disease
Bureau for Global Health
U.S. Agency for International Development (USAID)

REDACTED

EigenBio

Understanding the immune response through applied mathematics

A Systems Biology Approach Immunome Analysis

EigenBio 3591 Anderson Street, Madison WI 53704 • Contact: jane_homan@EigenBio.com • Tel: 608.310.9540

EigenBio

Understanding the immune response through applied mathematics

Immunology as an applied math challenge

- EigenBio has adopted an applied math, deep learning approach to understanding the immune system
- Genome, proteome…. but health and disease depend mostly on how proteins are seen as an immunome
  - The immunome is the complex recognition pattern resulting from the interaction of multiple facets/processes making up the immune responses
- Understanding immunology is a mathematical challenge, but has traditionally been approached as a experimental problem, in which variables are fixed
  - This fails to recognize the fuzzy logic and multivariate interactions
  - Reductionist approaches yield results which may mislead in a larger context
- EigenBio has built a comprehensive series of analytical tools
  - Based on principal component analysis and neural networks…
  - Enabling high throughput analysis
  - Integrating of many components of the immune response
  - Includes temporal and spatial frequency distributions
  - That recognizes the immune response depends not only on binary signals, but also critically the frequency distribution of signals and time
  - Providing visual outputs to facilitate understanding without math comprehension by biologists, clinicians and patients
  - Applicable to single proteins or populations of whole organism proteomes and to the human proteome

A Unique Systems Approach

- Immune responses – both immune stimulation and immunosuppression result from the interface of multiple independent sets of variables, including both stochastic and genetically determined variables.
- Each variable has a finite universe but combined provide enormous diversity and ability to respond to unique circumstances
  - Pentameric language - In many cases the immune response depends on an amino acid pentamer – continuous or discontinuous – resulting in 20^5 or 3.2 million possible configurations or signals
  - With multiple overlaid variables, the combinatorial possibilities are vast…allowing recognition and differentiation of self and non-self with a limited T cell repertoire
- With Big Data, patterns emerge
  - reflecting disease states, characterizing pathogen survival and transmission, and outcome of mutations in cancer…..
  - which can then be drilled down to an individual patient to "personalize" interventions or design vaccine interventions

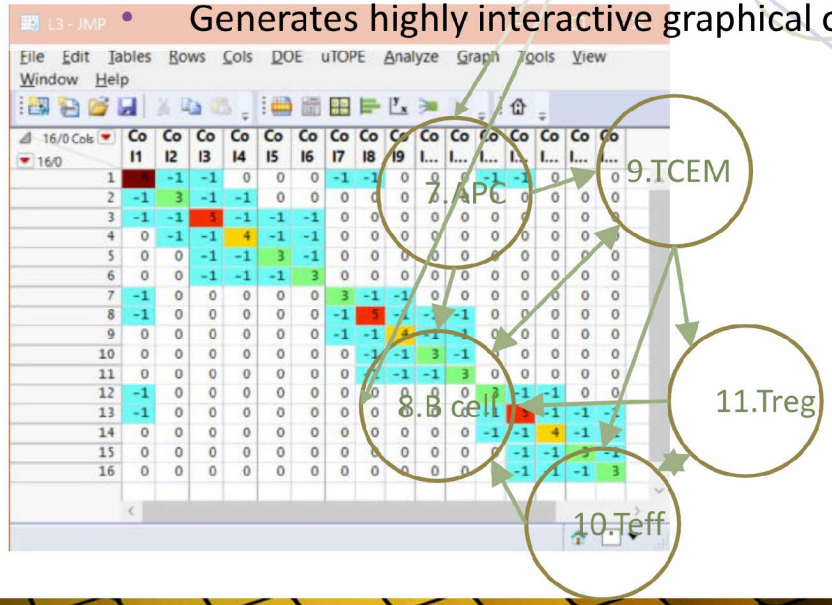
EigenBio Analytics

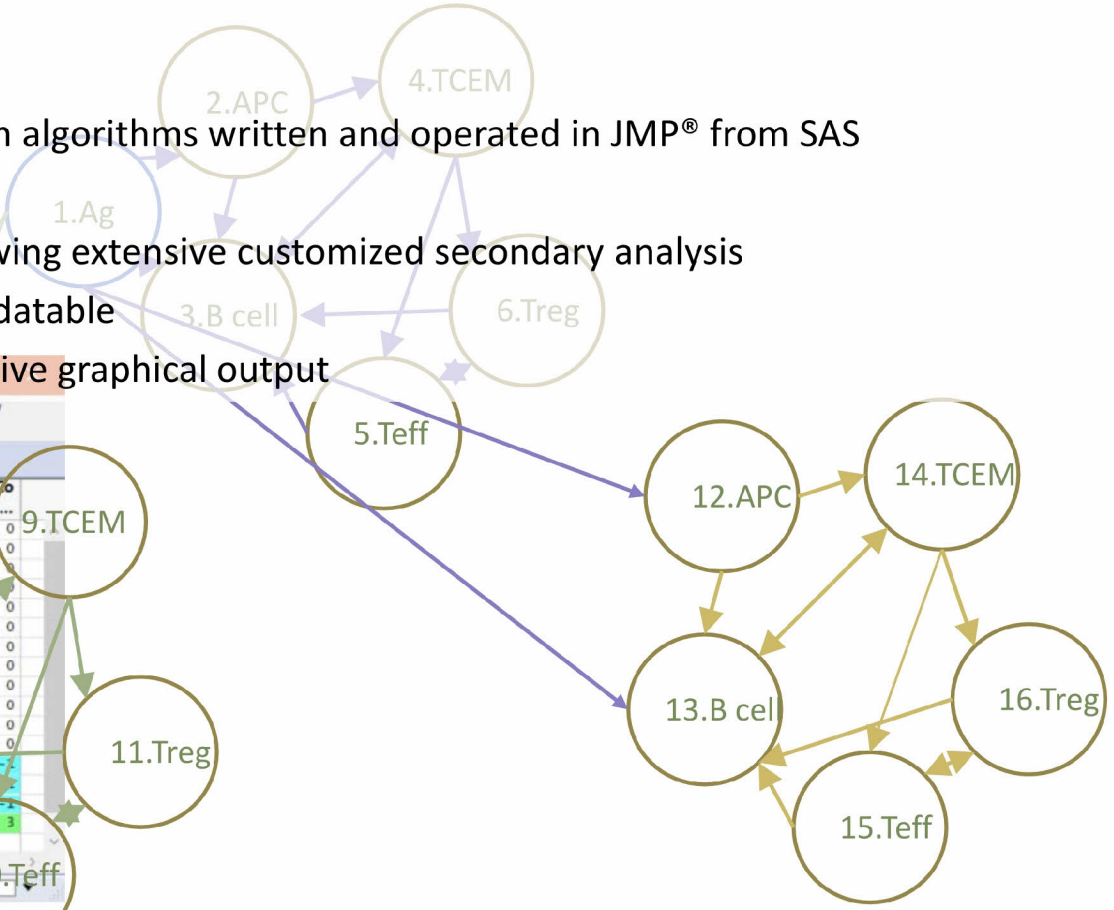
Immune Network Control

- Much of the underlying mathematical operations used in our analytics involve matrix algebra and in particular eigen decomposition of matrices to derive the essence of biological function

Software

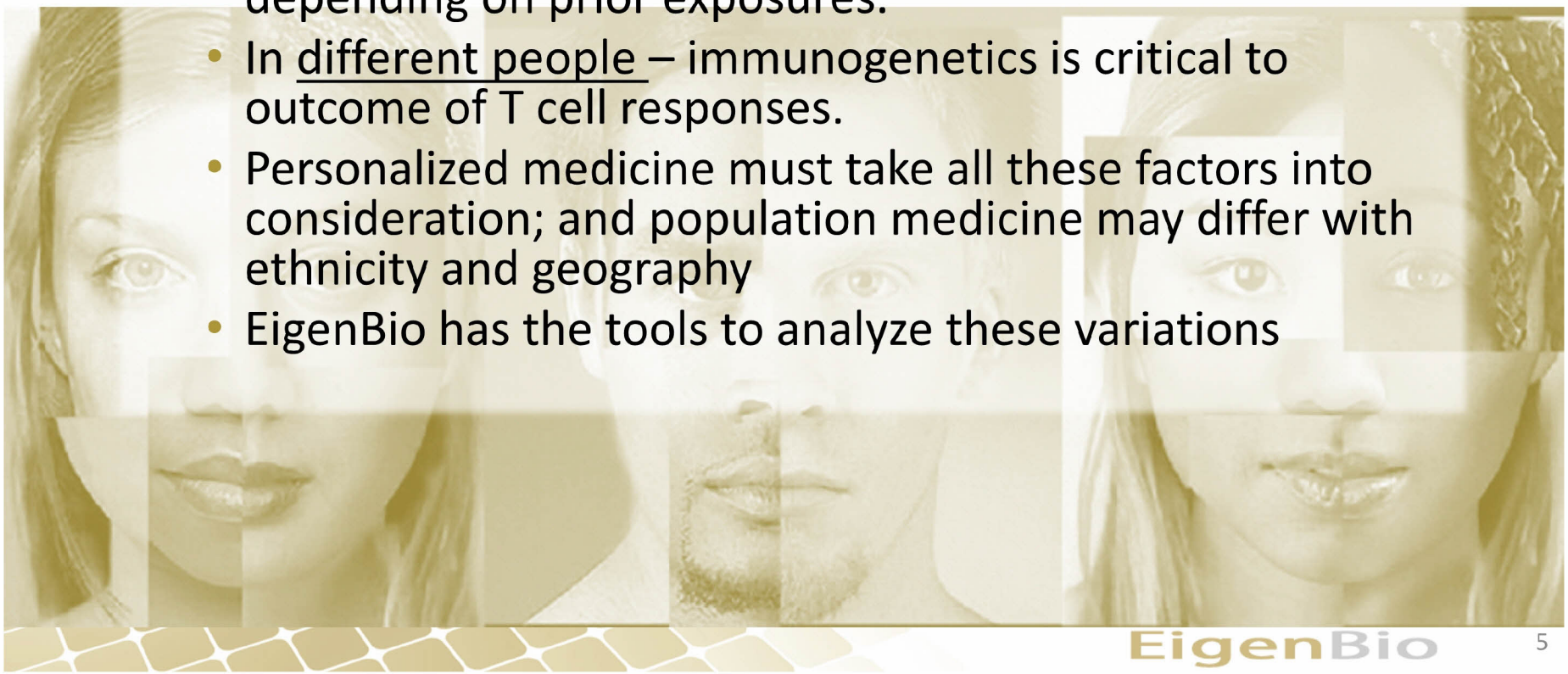
- EigenBio analytics are based on algorithms written and operated in JMP® from SAS Institute
  - A versatile interface allowing extensive customized secondary analysis
  - Software is FDA/ ISO validatable
  - Generates highly interactive graphical output





Big picture… pattern recognition

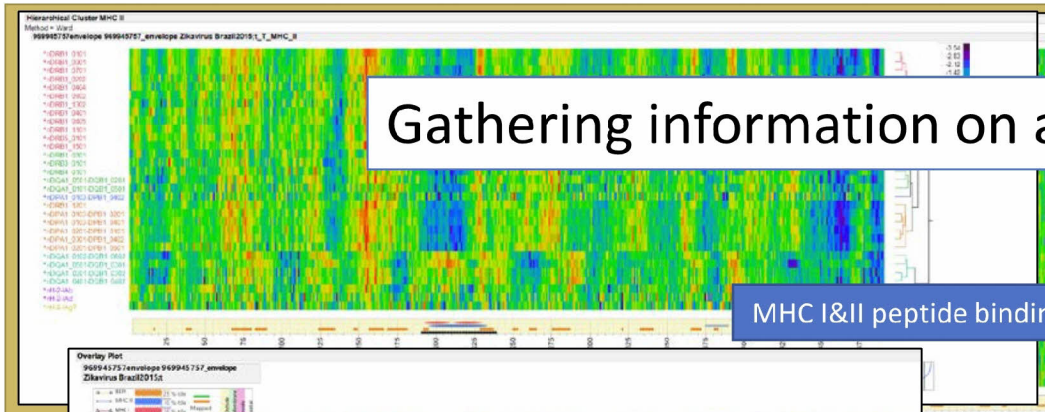
- A applied math approach has given us tools to recognize how immune responses vary
  - At different life stages – from *in utero* to ageing
  - In different ecosystems – the interface of responses to co-endemic pathogens and how this may affect outcome, depending on prior exposures.
  - In different people – immunogenetics is critical to outcome of T cell responses.
  - Personalized medicine must take all these factors into consideration; and population medicine may differ with ethnicity and geography
  - EigenBio has the tools to analyze these variations

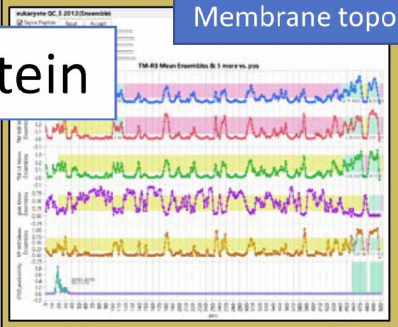


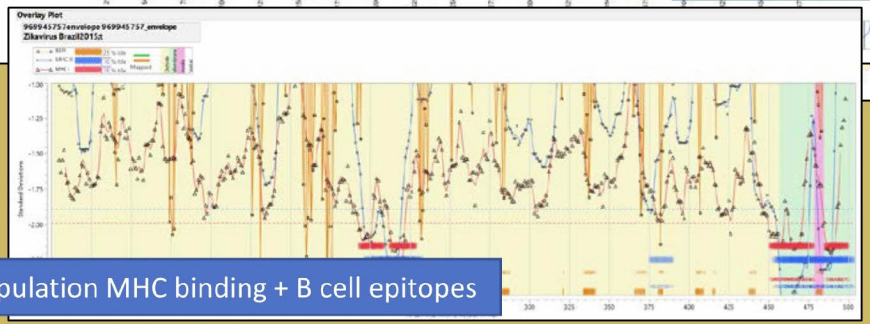
EigenBio is currently applying its analytical tools in these areas:

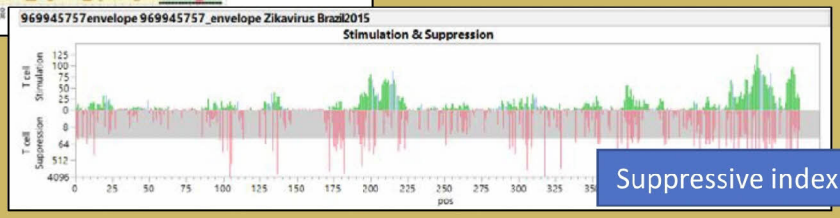
- Characterization of T-cell and B-cell repertoires in multiple sclerosis and chronic lymphocytic leukemia
- Characterization of cancer neoantigens
- Understanding immunosuppressive properties of cancer-linked viruses (e.g. HPV, EBV)
- Design of diagnostics for Zika virus in dengue/yellow fever/chikungunya endemic areas; flavivirus pathogenesis
- Understanding T-cell epitope sharing between pathogens, microbiome, and human self-proteins; epitope sharing among helminth parasites
- Relating viral B-cell epitope mimics of self proteins to clinical disease
- Understanding pathogen immune evasion – *Mycobacterium, Francisella,* and *Burkholderia*
- Characterizing pandemic strains of influenza
- Determining the immunonutritional/immune balancing properties of milk derived immunoglobulins

Gathering information on a single protein

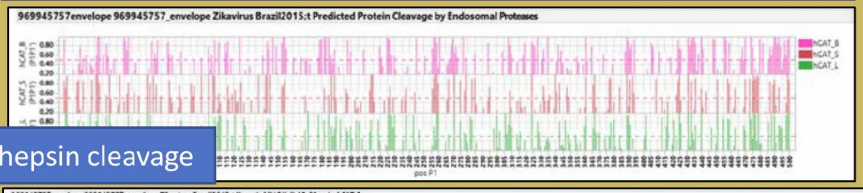

MHC I&II peptide binding


Membrane topology

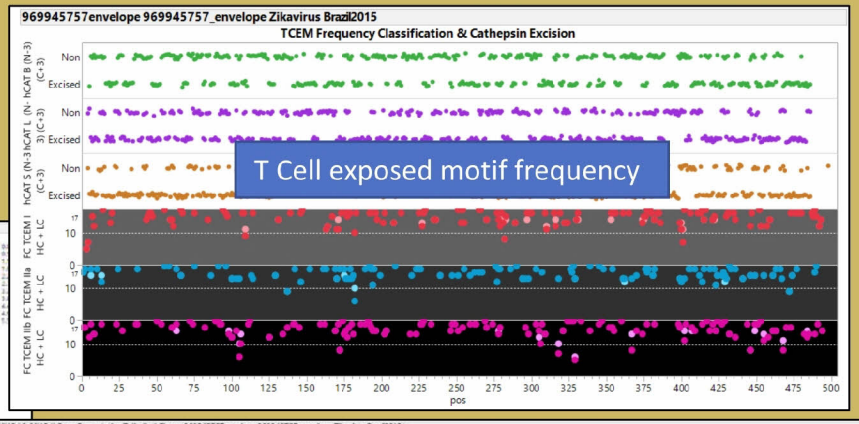

Population MHC binding + B cell epitopes



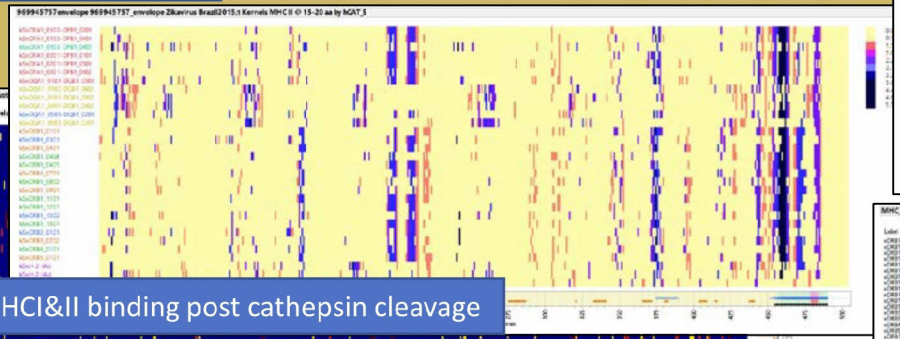
Suppressive index

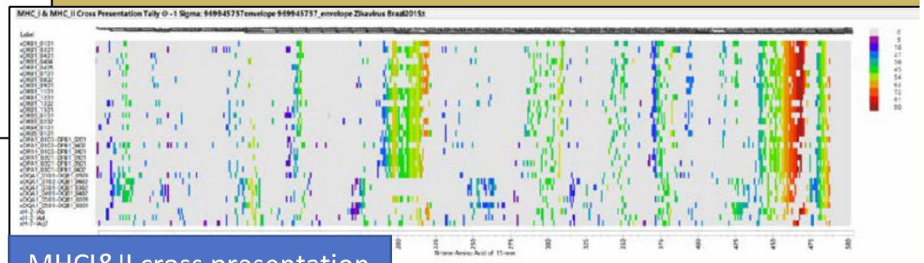


Cathepsin cleavage



T Cell exposed motif frequency

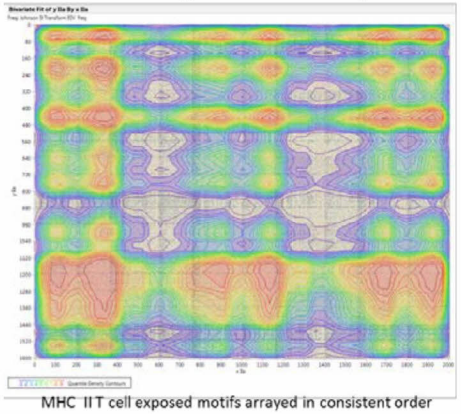

MHCI&II binding post cathepsin cleavage


MHCI&II cross presentation

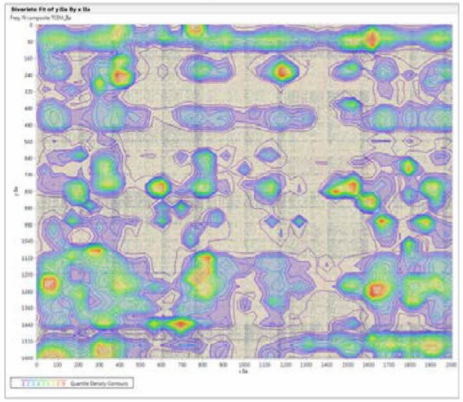
Bigger data patterns…a few examples…

Comparing T cell repertoires in normal vs autoimmune disease – MS example

Normal Immunoglobulin TCEM Repertoire

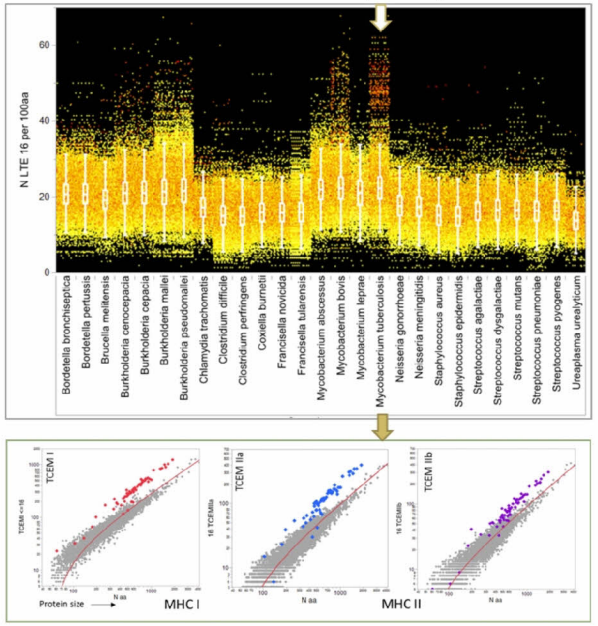


MS patient Immunoglobulin TCEM Repertoire

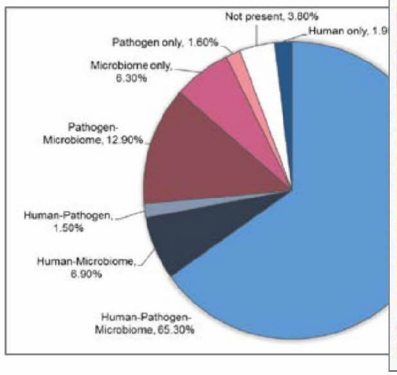


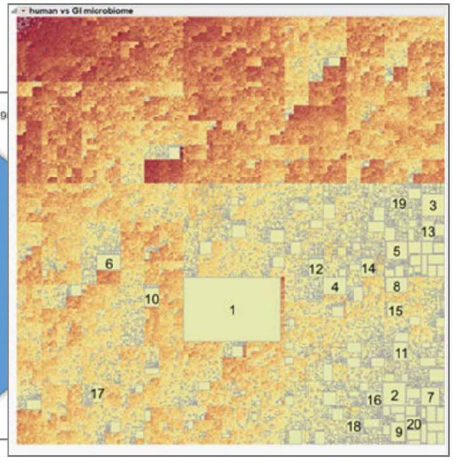
MHC II T cell exposed motifs arrayed in consistent order

Relating Immune evasion by Mtb to "self-like" T cell epitopes

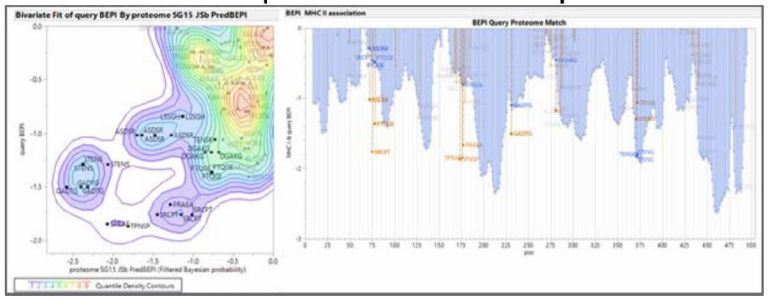


T cell exposed peptide sharing – human and gastrointestinal microbiome





Identifying B cell mimics in Zika which may elicit autoimmune responses to human proteins



Technical Annex

Intellectual Property

- ioGenetics LLC has extensive patent filings relating to its EigenBio computational platforms, vaccine/diagnostics design, and immunonutritional applications.

Relevant publications

- **Computational Immunology**
  - Extensive T-Cell Epitope Repertoire Sharing among Human Proteome, Gastrointestinal Microbiome, and Pathogenic Bacteria: Implications for the Definition of Self. Bremel RD, Homan EJ. Front Immunol. 2015 Oct 22;6:538. doi: 10.3389/fimmu.2015.00538. eCollection 2015. PMID: 26557118
  - Frequency Patterns of T-Cell Exposed Amino Acid Motifs in Immunoglobulin Heavy Chain Peptides Presented by MHCs. Bremel RD, Homan EJ. Front Immunol. 2014 Oct 28;5:541. doi: 10.3389/fimmu.2014.00541. eCollection 2014. Review. PMID: 25389426
  - Are cases of mumps in vaccinated patients attributable to mismatches in both vaccine T-cell and B-cell epitopes?: An immunoinformatic analysis. Homan EJ, Bremel RD. Hum Vaccin Immunother. 2014;10(2):290-300. doi: 10.4161/hv.27139. Epub 2013 Nov 25. PMID:24275080
  - Recognition of higher order patterns in proteins: immunologic kernels. Bremel RD, Homan EJ. PLoS One. 2013 Jul 29;8(7):e70115. doi: 10.1371/journal.pone.0070115. Print 2013. PMID: 23922927
  - Patterns of predicted T-cell epitopes associated with antigenic drift in influenza H3N2 hemagglutinin. Homan EJ, Bremel RD. PLoS One. 2011;6(10):e26711. doi: 10.1371/journal.pone.0026711. Epub 2011 Oct 24. PMID: 22039539
  - An integrated approach to epitope analysis II: A system for proteomic-scale prediction of immunological characteristics. Bremel RD, Homan EJ. Immunome Res. 2010 Nov 2;6:8. doi: 10.1186/1745-7580-6-8. PMID: 21044290
  - An integrated approach to epitope analysis I: Dimensional reduction, visualization and prediction of MHC binding using amino acid principal components and regression approaches. Bremel RD, Homan EJ. Immunome Res. 2010 Nov 2;6:7. doi: 10.1186/1745-7580-6-7. PMID: 21044289
- **Zika Virus**
  - Zika Virus: Medical Countermeasure Development Challenges. **Malone** RW, **Homan** J, Callahan MV, Glasspool-**Malone** J, Damodaran L, Schneider Ade B, Zimler R, Talton J, Cobb RR, Ruzic I, Smith-Gagen J, Janies D, Wilson J; Zika Response Working Group. PLoS Negl Trop Dis. 2016 Mar 2;10(3):e0004530. doi: 10.1371/journal.pntd.0004530. eCollection 2016 Mar. Review. PMID: 26934531
  - Antibody mediated epitope mimicry in the pathogenesis of Zika virus related disease. Jane Homan, Robert W Malone, Steven J Darnell, Robert D Bremel available as preprint at http://biorxiv.org/content/early/2016/03/19/044834

Components of EigenBio Integrated Immunome Analysis

Immunological Metric	Method	Prediction
MHC I affinity **9-mer**	1. Neural Network Ensembles trained on binding data 2. sliding window of 9-aa indexed by 1 amino acid 3. 20 HLA-A 4. 17 HLA-B 5. 6 murine	1. LN (IC_{50}) 2. std dev LN(IC_{50}) (ave = 0.5 LN (IC_{50})) 3. standardized affinity within protein or proteome (enables using additivity of variance) 4. relative binding probability thresholds for each peptide
MHC II affinity **15-mer**	1. Neural Network Ensembles trained on binding data 2. sliding window of 15-amino acids indexed by 1 amino acid 3. 16 DR 4. 6 DP 5. 6DQ	1. LN (IC_{50}) 2. std dev LN(IC_{50}) (ave = 0.5 – 0.7 LN (IC_{50})) 3. standardized affinity within protein or proteome (enables using additivity of variance) 4. relative binding probability thresholds for each peptide
MHC + MHC II cross presentation	MHC I + MHC II simultaneous binding to peptides in a protein	Number of high affinity MHC I 9-mers within each high affinity MHC II 15-mer
Linear B-cell epitope **8-mer**	1. Neural network trained on B-cell epitopes 2. Sliding window of 8 amino acids indexed by 1 aa	1. probability of B cell binding standardized within protein 2. relative probability among peptides
Cathepsin cleavage **Human cathepsin B, L and S**	Neural Network Ensembles trained on large proteomic cleavage database mass spectrometry of cleaved peptides for the enzymes.	Two independent predictions probability of cleavage + probability of non-cleavage between aa4 and aa5 (P1P1') of an octomer
Combined cathepsin cleavage + MHC I + MHC II binding affinity	Combination of 3 prediction method outputs	Probability of excision of various length peptides between 15-21 amino acids in length for MHC II and exactly 9 amino acids.
T-cell exposed motif (TCEM) relative to normal human repertoires	Frequency comparison to database for: continuous pentamer within a bound MHC I 9-mer two discontinuous pentamers (9-mer core of a bound MHC II 15-mer)	1. Specific motifs exposed to T cell by peptide bound in MHC 2. Frequency relative to IGHV germline and somatic mutation 3. Frequency relative to human proteome 4. Frequency relative to GI microbiome
Combination of MHC I and MHC II binding by allele in combination with TCEM T-cell exposure and cathepsin cleavage	Graphical / interactive combination of 5 different prediction outputs	Interactive graphical platform for evaluation Treg potential based on combination of: 1. binding predictions and 2. TCEM frequency data using additivity of variance
Mimicry of B-cell receptors (immunoglobulins)	Pentamer (core of 9-mer BEPI prediction) exposure comparison between proteins of interest (e.g. viral protein vs multiple isoforms of all proteins in human proteome) in combination with MHC binding predictions	1. Proximity of MHC binding regions to BEPIs 2. Pentamer matches (random probability of match = 20^{-10}) 3. BEPI probability classification matches between selected proteins 4. UniProt keyword screens 5. URL connection to internet resources
Protein topology	1. Neural Network Ensembles 2. Slider, graphical interface 3. compared to Web references	1. Amino acids of protein comprising extra-cellular domain 2. Amino acids of protein comprising intra-cellular domains 3. Amino acids of protein comprising trans-membrane domains 4. Signal peptides cleavage point

From: Elizabeth Leasure <ealeasure@ucdavis.edu>
To: Andrew Clements <aclements@usaid.gov>, Cassandra Louis Duthil <clouisduthil@usaid.gov>
Cc: Alisa Pereira <apereira@usaid.gov>, Cassandra Louis Duthil <clouisduthil@usaid.gov>, Cara Chrisman <cchrisman@usaid.gov>, "David John Wolking" <djwolking@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Katherine Leasure <kaleasure@ucdavis.edu>
Subject: Time Sensitive: PREDICT International Travel - GVP Beijing Update
Sent: Thu, 19 Jan 2017 17:50:24 +0000

Hi Cassandra and Andrew. Just wanted to follow up on concurrence for this update to the Beijing meeting ITA, as we need to move forward with bookings for Danielle Anderson, or she may not be able to get her visa in time due to office closures for the Chinese New Year. Would you mind following up on this or confirming that we can proceed?

Thanks,
Liz

Elizabeth Leasure
One Health Institute
University of California, Davis
530-754-9034 (office)
REDACTED (cell)

From: Andrew Clements [mailto:aclements@usaid.gov]
Sent: Friday, January 13, 2017 1:48 AM
To: Elizabeth Leasure
Cc: Alisa Pereira; Cassandra Louis Duthil; Cara Chrisman; David John Wolking; Jonna Mazet; Katherine Leasure
Subject: Re: PREDICT International Travel - GVP Beijing Update

Thanks, Liz.

Changes noted and travel approved subject to RDMA concurrence.

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov
On Jan 13, 2017, at 2:15 AM, Elizabeth Leasure <ealeasure@ucdavis.edu> wrote:

> Hi Andrew. Please note that **Jaime Sepulveda** and **Nathan Wolfe** have cancelled their participation in the Beijing meeting due to scheduling conflicts.
>
> I have also been advised of an update to the ITA of participant, Gian Luca Burci. He will depart from Geneva, Switzerland rather than Washington, DC, as that is where he is now based. Lastly, I have included a new ITA for Danielle Anderson, who was recommended to the GVP Beijing meeting by another who was not able to attend (LinFa Wang; not included in original ITA).
>
> 1. Burci (China): $1,700 airfare/$377 (Beijing) max daily per diem
> 2. Anderson (China): $1,200 airfare/$377 (Beijing) max daily per diem
>
> Travel requests:
>
> 1. UC Davis would like to request approval for Gian Luca Burci to travel from Geneva, Switzerland to Beijing, China from February 4-8, 2017 for a Global Virome Project Working Group meeting to take place February 5-7, 2017.
>
> **Trip purpose:** Mr. Burci is an invited participant of the Global Virome Project. The meeting will provide an opportunity for working groups to meet and collaborate on project strategies development. There will also be a press event to announce the China National Virome Project.

2. UC Davis would like to request approval for Danielle Anderso to travel from Singapore to **Beijing, China** from February 4-8, 2017 for a Global Virome Project Working Group meeting to take place February 5-7, 2017.

Trip purpose: Ms. Anderson is an invited participant of the Global Virome Project. The meeting will provide an opportunity for working groups to meet and collaborate on project strategies development. There will also be a press event to announce the China National Virome Project.

Elizabeth Leasure
One Health Institute
University of California, Davis
530-754-9034 (office)
REDACTED (cell)

From: Andrew Clements <aclements@usaid.gov>
Sent: Sat, 28 Jan 2017 18:35:44 +0100
Subject: Re: PREDICT International Travel Requests
To: Elizabeth Leasure <ealeasure@ucdavis.edu>
Cc: PREDICTMGT <predictmgt@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, David John Wolking <djwolking@ucdavis.edu>, Katherine Leasure <kaleasure@ucdavis.edu>

Approved subject to mission concurrence.

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On Jan 28, 2017, at 1:38 AM, Elizabeth Leasure <ealeasure@ucdavis.edu> wrote:

Please find below international travel requests for your review and approval. Please let me know if you have any questions. Thanks!!

1. Epstein (Liberia): $3,000 airfare/$295 (Monrovia) max daily per diem
2. Dawson (Jordan): $1,000 airfare/$390 (Amman) max daily per diem
3. Karesh (Jordan): $4,500 ([redacted]/$390 (Amman) max daily per diem
4. White (Ethiopia): $5,500 airfare/$400 (Addis Ababa) max daily per diem
5. Edison (DRC): $1,537 airfare/$394 (Kinshasa) max daily per diem
6. Lucas (RoC, DRC): $1,302/$302 (Brazzaville), $394 (Kinshasa) max daily per diems
7. Ayukekbong (Cameroon, RoC, DRC): $2,308 airfare/$244 (Yaounde), $302 (Brazzaville), $394 (Kinshasa) max daily per diems
8. Saylors (Cameroon): $902 airfare/$244 (Yaounde) max daily per diem
9. Valitutto (Myanmar): $3,000 airfare/$347 (Yangon) max daily per diem
10. Kane (Rwanda): $700 airfare/$294 (Kigali)

Travel Requests:

1. EcoHealth Alliance would like to request travel approval for Jon Epstein to travel from New York, NY, USA to Monrovia, Liberia from February 19-24, 2017 to meet with the PREDICT global team.

Trip Purpose: Dr. Jon Epstein will meet with PREDICT-2 in-country management team, visit LIBR, meet with USAID mission, and liaise with our PREDICT global team lab leads.

2. EcoHealth Alliance would like to request travel approval for Patrick Dawson to travel from New York, NY, USA to Amman, Jordan from February 24-28, 2017 to develop strategic partnerships at an EPT-2 meeting.

Trip purpose: Mr. Dawson will be attending the high-level meeting to discuss EPT-2 work in Jordan with representatives from the Ministries of Health, Agriculture, and Environment.

3. EcoHealth Alliance would like to request travel approval for Dr. William Karesh to travel from Johannesburg, South Africa to Amman, Jordan from February 24-28, 2017 to develop strategic partnerships at an EPT-2 meeting.

Trip purpose: Dr. Karesh will be attending the high-level meeting to discuss EPT-2 work in Jordan with representatives from the Ministries of Health, Agriculture, and Environment.

4. EcoHealth Alliance would like to request travel approval for Allison White to travel from New York, NY, USA to Addis Ababa, Ethiopia from February 18-24, 2017 to participate in regional meeting of the African Sustainable Livestock 2050 project.

Trip purpose: This meeting aims to liaise with national governments to support the development of the project, as well as discuss potential implications of future livestock market development on health, environment, and socioeconomic aspects. Ms. White will be attending the Livestock Systems and Public Health Working Group meeting.

5. Metabiota would like to request travel approval for Beth Edison, Program Manager, to travel from Nanaimo, British Columbia, Canada to Kinshasa, Democratic Republic of Congo from March 19-25, 2017 to support the DRC team on financial reports and administrative functions within the PREDICT program.

Trip purpose: Beth Edison will work closely with the in-country team to evaluate and work with the administration on financial reports and to involve and support James Ayukekbong on these aspects.

6. Metabiota would like to request travel approval for Ashley Lucas, Clinical Specialist, to travel from Cape Town, South Africa to Brazzaville, Republic of Congo from March 6-17, 2017 to review human surveillance strategy with the in-country team, complete hospital surveillance training and begin implementation in hospital, and implement a plan for animal surveillance. From Brazzaville, Republic of Congo, she will travel to Kinshasa, Democratic Republic of Congo from March 18-22, 2017 to review human surveillance strategy with the in-country team and visit field surveillance sites.

Trip purpose: RoC – On January 11, 2017, the IRB for the Republic of Congo was approved. In order to begin human behavioral surveillance, and evaluate capacity for human syndromic surveillance, Ashley Lucas and James Ayukekbong will work with the behavioral team on beginning human surveillance in bush meat markets and implement a plan for concurrent animal surveillance. The team will also visit a proposed human syndromic surveillance site in Brazzaville, to assess capacity and identify collaborating staff. DRC – Ashley Lucas and James Ayukekbong will work closely with the in-country team to evaluate and revise the human and animal surveillance strategy, and visit human syndromic surveillance sites.

7. Metabiota would like to request travel approval for James Ayukekbong, Central African Coordinator, to travel from Nanaimo, British Columbia, Canada to Yaoundé, Cameroon from February 27-March 5, 2017 to review human surveillance strategy with the in-country team and implement a plan for animal surveillance. From Yaoundé, Cameroon, he will travel to Brazzaville, Republic of Congo from March 6-17, 2017 to review human surveillance strategy with the in-country team and visit field surveillance sites. From Brazzaville, Republic of Congo, he will travel to Kinshasa, Democratic Republic of Congo from March 18-24, 2017 to visit human syndromic surveillance sites.

Trip purpose: Cameroon – James Ayukekbong and Dr. Karen Saylors will work closely with the in-country team to evaluate and revise the human and animal surveillance. Dr. Saylors will introduce James as the new Central African Coordinator to the PREDICT Cameroon team. RoC – On January 11, 2017, the IRB for the Republic of Congo was approved. In order to begin human behavioral surveillance, and evaluate capacity for human syndromic surveillance, James Ayukekbong and Ashley Lucas will work with the behavioral team on beginning human surveillance in bush meat markets and implement a plan for concurrent animal surveillance. The team will also visit a proposed human syndromic surveillance site in Brazzaville, to assess capacity and perform training of the staff as well as initial roll out of participants. James and Charles from DRC will perform refresher training sessions for Fabien, the lab lead. DRC – James Ayukekbong and Ashley Lucas will work closely with the in-country team to evaluate and revise the human and animal surveillance strategy, and visit human syndromic surveillance sites.

8. Metabiota would like to request travel approval for Dr. Karen Saylors to travel from San Francisco, CA, USA to Yaoundé, Cameroon from February 27-March 4, 2017 to review human surveillance strategy with the in-country team and visit field surveillance sites.

Trip purpose: Dr. Saylors and James Ayukekbong and will work closely with the in-country team to evaluate and revise the human and animal surveillance. Dr. Saylors will introduce James as the new Central African Coordinator to the PREDICT ROC team and will work with Mat LeBreton to orient the new PREDICT Country Coordinator for Cameroon, as well as to work with the identified behavioral team lead in Yaoundé.

9. The Smithsonian Institution would like to request travel approval for Dr. Marc Valitutto to travel from Washington, DC, USA to Yangon, Myanmar for the period of February 24-April 14, 2017 to continue building lab capacity, attend meetings, coordinate a sampling trip with FAO, and finalize training for in-country staff.

Trip purpose: Dr. Valitutto will be in charge of continued capacity building of the laboratories, sitting for the ERC hearing, organizing a collaborative sampling trip with FAO in Hpa An, attending a collaborative meeting with WHO for human surveillance, and finalizing training for in-country staff.

10. UC Davis would like to request travel approval for Ismaila Kane to travel from Dakar, Senegal to Kigali, Rwanda from February 19-24, 2017 to attend fieldwork training with the PREDICT Rwanda team.

Trip purpose: Ismaila Kane will attend a field sampling trip and be trained in the safe capture and sampling of wildlife under the mentorship of Dr. Julius Nziza. In addition, Ismaila will gain an insight into the roles and responsibilities of a Country Coordinator, including project management and stakeholder communication.

--

From: Andrew Clements <aclements@usaid.gov>
Sent: Tue, 14 Feb 2017 22:10:52 +0100
Subject: Re: NPR: Why Killer Viruses Are On The Rise
To: Jonna Mazet <jkmazet@ucdavis.edu>

Thanks!

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On Feb 14, 2017, at 8:07 PM, Jonna Mazet <jkmazet@ucdavis.edu> wrote:

> Great NPR story on Predict, featuring Kevin Olival.
> Have a good day,
> J

Why Killer Viruses Are On The Rise
NPR

If you think there are more dangerous infectious diseases than ever, you're right. One big reason: pushing animals like this one out of their homes. Read the full story

From:	William B. Karesh <karesh@ecohealthalliance.org>
To:	David Wolking <djwolking@ucdavis.edu>
CC:	Jonna Mazet <jkmazet@ucdavis.edu>;Kevin Olival, PhD" <olival@ecohealthalliance.org>
Sent:	2/23/2017 7:28:44 AM
Subject:	Re: Request by 3/3- Information on Zoonotic Disease Illnesses or Outbreaks in Tanzania

Very cool, Thanks !!!

We will put somthing together like that if we get the DTRA grant. May still want to follow up with a phone call, so thanks for being available.

BK

William B. Karesh, D.V.M
Executive Vice President for Health and Policy

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President, OIE Working Group on Wildlife

Co-chair, IUCN Species Survival Commission - Wildlife Health Specialist Group

EPT Partners Liaison, USAID Emerging Pandemic Threats - PREDICT-2 Program

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that promote conservation and prevent pandemics.

On Feb 23, 2017, at 10:11 AM, David J Wolking <djwolking@ucdavis.edu> wrote:

Hi Billy,

I'd be happy to talk more about our management of the USAID and CBEP projects. A similar question was posed (not the first time) by Andrew Long-Wagar and the ETD team at USAID after the meetings in DC. We shared the attached brief with USAID to highlight the distinction between the projects along with their synergies in supporting interagency efforts under the GHSA.

Let's connect in early March as you suggest, feel free to reach out with a date/time when you're back in the States.

David

On Wed, Feb 22, 2017 at 10:46 PM, William B. Karesh <karesh@ecohealthalliance.org> wrote:
Hi David,

It was great meeting Chris and Abel at the DTRA meeting. When they presented the CBEP work it looked a

lot like the sampling for PREDICT so I asked them how they are keeping the projects and time separated because we are hoping to hear from CBEP soon about bat work in Western Asia that would include Jordan. I'm copying Kevin here because he will be PI on the CBEP project and we want to make sure there is no confusion between the two projects since both will involve bats and coronaviruses. Chris and Abel said that there is no overlap with people, labs or databases so that keeps it easy to separate the projects. Right now, we are planning to use a different implementing partner that have their own field staff and labs, but we were hoping to be able to share findings between the projects.

Could Kevin and I give you a call when I get back to the states in early March to get some advice from how you manage the two projects in Tanzania?

Thanks

BK

On Feb 22, 2017, at 9:18 PM, David J Wolking <djwolking@ucdavis.edu> wrote:

Hi Tanzania team,

We didn't touch on this on the call today but since we have now received the official request for information from CDC, it's time to begin planning and preparing an information packet to share, similar to the example I sent along to you all from Uganda.

With teams in the Lake Zone or preparing for departure now I suggest Abel and Chris as the best POCs for helping organize information.

Abel would you be willing to act as lead since you have been engaged in these meetings?

Let's make a plan very soon and identify the best combo of global, regional, and country specific resources that highlight our work and the importance of zoonotic viruses (known and emerging) as well as the risk of spillover from wildlife, etc so these themes are recognized by the planning committee and given fair attention at the workshop.

Please let me know how you would like to organize the preparation and Taylor and I will do whatever we can to assist.

Best,

David

On Wed, Feb 22, 2017 at 07:29 One Health (CDC) <onehealth@cdc.gov> wrote:

Dear partners,

CDC and USAID are collaborating with the government of Tanzania to conduct a One Health Zoonotic Disease Prioritization (OHZDP) workshop. CDC has developed a One Health Zoonotic Disease Prioritization Tool (OHZDPT) which allows a country to bring together multisectoral, One Health representatives to prioritize endemic and emerging zoonoses of greatest national concern using equal input from all represented sectors including human, animal (livestock and wildlife), and environmental health. Having a list of prioritized zoonoses allows a country to focus limited financial and personnel resources to build laboratory capacity, strengthen surveillance in humans and animals, develop joint outbreak response plans, and to create joint prevention and control strategies. Specific details are in the attachment titled, "CDC One Health Zoonotic Disease Prioritization Workshop Overview." The prioritization of zoonotic diseases is a key component of

GHSA and GHSA roadmaps and helps to set priorities for further systems capacity building in line with GHSA and JEE. Tanzania's National One Health Platform is hosting the workshop.

Beginning about 60 days before the desired workshop date, trained CDC workshop facilitators work with in country partners to develop a list of endemic and emerging zoonoses of concern for prioritization during the workshop and to identify multisectoral partners, both voting members and observers, for participation in the workshop.

The OHZDP tool is semi-quantitative and relies on facilitators, in collaboration with stakeholders, generating a list of zoonoses in advance of workshop discussions. Before the stakeholders come together, developing a list of endemic and emerging zoonotic diseases that each ministry would like to discuss during the prioritization workshop is needed. This list is developed from both published and unpublished information sources. A team approach should be used to develop the list of about 30-40 endemic and emerging zoonotic diseases for prioritization during the workshop. The CDC One Health Office has started with a list of 32 endemic and emerging zoonotic diseases that have been identified either as reportable diseases in Tanzania's National One Health Strategy Plan, and/or were deemed important in the report of the expert group selected to prioritize zoonotic diseases in Tanzania, October-December 2016. Please find the list of 32 diseases attached.

CDC facilitators coordinate the creation of this list and literature review by working with in-country partners, including CDC and USAID staff. We would like to give partners the opportunity to share information and data on zoonotic diseases in Tanzania that may be beneficial to have during the workshop. We are asking partners to share any available information such as reports, publications, or other materials regarding zoonotic disease illnesses or outbreaks in Tanzania. If you have any additional information you'd like to share on any of the zoonoses on the existing list, or on zoonoses that are not listed, but are present in Tanzania, please let us know by **Friday, March 3rd. Send all information to onehealth@cdc.gov and CDC facilitators Karen Alroy (nfu1@cdc.gov) and Carrie Eggers (xfy1@cdc.gov).**

Thank you for your partnership in preparing for Tanzania's One Health Zoonotic Disease Prioritization Workshop. If you have any questions, please let us know.

Kerri Simone, MPH *on behalf of*

CDC One Health Office

cdc.gov/onehealth

Click on the icon to subscribe to One Health updates from CDC.

--
Sent from Gmail Mobile

From: [redacted]
To: "Kevin Olival, PhD" <olival@ecohealthalliance.org>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, Peter Daszak <daszak@ecohealthalliance.org>, Anna Willoughby <willoughby@ecohealthalliance.org>
Subject: Re: Viral risk ranking data
Sent: Wed, 19 Apr 2017 16:15:07 +0000

Hi Kevin,

Thanks for sharing this data, it will be intriguing to see the outcome of your further analysis. I would be interested in discussing how you calculated the PHB for the P1 viruses and other data you have, for example, Phylogenetic Distance to humans (cytB). It may be easier to discuss this over the phone, when's a good time for you over the next few weeks?

Kind regards,

REDACTED

[redacted]

Project Scientist, PREDICT Project of USAID
Postdoctoral Researcher in Disease Ecology
One Health Institute
School of Veterinary Medicine
University of California Davis
1089 Veterinary Medicine Drive
Davis, CA 95616, USA

Mobile: +1-530-601-3944

From: "Kevin Olival, PhD" <olival@ecohealthalliance.org>
Date: Thursday, April 13, 2017 at 12:36 PM
To: [redacted]
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, Peter Daszak <daszak@ecohealthalliance.org>, Anna Willoughby <willoughby@ecohealthalliance.org>
Subject: Re: Viral risk ranking data

REDACTED

Attached is a .csv with Phylogenetic Host Breadth (PHB) max, median, and min, calculated for all P1 viruses from EIDITH using methods in HP3 and the mammalian supertree for distances. Note, any viruses with only one host (in EIDITH) will return a 0 value for PHB.

As a next step: for all the previously known viruses, we are going to compare how our understanding of host breadth has changed by adding in P1 host associations from what we previously knew from the literature (HP3). i.e. we will compare PHB values with HP3 data alone, and PHB values with literature + predict mammal hosts for the ~200 or so previously known viruses. We are just working to synonomize the viral species names in EIDITH with those in ICTV (that we used for HP3), so this will take a little bit more time. This should be an interesting output too.

Happy to discuss any of this as relevant for the viral ranking work if you have any questions. We can share code etc too as we collaborate further on this analysis.

Cheers,
Kevin

From: Andrew Clements <aclements@usaid.gov>
Sent: Fri, 2 Jun 2017 16:02:38 +0200
Subject: Re: ZWE 02-06-17 OIE Alert - Alerta - Alerte - Highly pathogenic avian influenza - Influenza aviaire hautement pathogène - Influenza aviar altamente patógena
To: "Lisa Kramer (Nairobi/EA/RHH)" <lkramer@usaid.gov>, Sarah Paige <spaige@usaid.gov>, "alongwagar@usaid.gov" <alongwagar@usaid.gov>, Dennis Carroll <dcarroll@usaid.gov>, Alisa Pereira <apereira@usaid.gov>, Angela Wang <awang@usaid.gov>, "Subhash Morzaria (FAORAP)" [redacted] "rgreene@usaid.gov" <rgreene@usaid.gov>, Ricardo Echalar <rechalar@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, William Karesh <Karesh@ecohealthalliance.org>, Christine Kreuder Johnson <ckjohnson@ucdavis.edu>, "A. Danielle (CDC/OID/NCIRD) Iuliano" <aoi0@cdc.gov>, Gina Samaan [redacted], Wenqing Zhang [redacted], Elizabeth Mumford [redacted]

Forgot to mention, 14 days from event start to detection and reporting for a country that has never had H5 HPAI is excellent, especially since they also determined the N-type as well.

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On Jun 2, 2017, at 3:59 PM, Andrew Clements <aclements@usaid.gov> wrote:

FYI. The plot thickens....

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

Begin forwarded message:

From: oie-info-web@oie.int
Date: June 2, 2017 at 4:18:00 PM GMT+2
To: oie-info-web@oie.int
Subject: ZWE 02-06-17 OIE Alert - Alerta - Alerte - Highly pathogenic avian influenza - Influenza aviaire hautement pathog□ne - Influenza aviar altamente pat□gena

English — PDF reports

Français — Rapports PDF

Español — informes PDF

Highly pathogenic avian influenza ,Zimbabwe

Information received on 01/06/2017 from Dr Unesu Hildah Ushewokunze-Obatolu, Principal Director, , Department of Livestock and Veterinary Services, Harare, Zimbabwe

Summary

Report type	Immediate notification
Date of start of the event	17/05/2017
Date of confirmation of the event	01/06/2017
Report date	01/06/2017
Date submitted to OIE	01/06/2017
Reason for notification	New strain of a listed disease in the country
Causal agent	Highly pathogenic avian influenza virus
Serotype	H5N8
Nature of diagnosis	Laboratory (advanced)
This event pertains to	a defined zone within the country

New outbreaks

Summary of outbreaks: **Total outbreaks: 1**

Outbreak Location:
- MASHONALAND EAST (LANARK, SEKE)

Total animals affected

Species	*Susceptible*	*Cases*	*Deaths*	*Killed and disposed of*	*Slaughtered*
Birds	2000000	7845	7845	75155	0

Outbreak statistics

Species	*Apparent morbidity rate*	*Apparent mortality rate*	*Apparent case fatality rate*	*Proportion susceptible animals lost**
Birds	0.39%	0.39%	100.00%	4.15%

* Removed from the susceptible population through death, destruction and/or slaughter;

Epidemiology

Source of the outbreak(s) or origin of infection	• Unknown or inconclusive
Epidemiological comments	The affected farm has 8 separately managed sites which are at least 1km apart. One of the eight sites was affected, a parent breeding unit for broilers with 83,000 birds. A total of 3,045 birds died within a week at this site showing signs consistent with highly pathogenic avian influenza. The affected site is close to a small dam where there are a number of different migratory waterfowl, which are tentatively suspected to be source of infection.

Control measures

Measures applied	• Movement control inside the country • Surveillance outside containment and/or protection zone • Surveillance within containment and/or protection zone • Screening • Traceability • Quarantine • Official destruction of animal products • Official disposal of carcasses, by-products and waste • Stamping out • Zoning • Disinfection • Vaccination prohibited • No treatment of affected animals
Measures to be applied	• No other measures

Diagnostic test results

Laboratory name and type	Onderstepoort Veterinary Institute, South Africa (Regional Reference Laboratory)			
Tests and results	*Species*	*Test*	*Test date*	*Result*
	Birds	real-time reverse transcriptase/polymerase chain reaction (RRT-PCR)	29/05/2017	Positive
	Birds	virus sequencing	01/06/2017	Positive

Future Reporting

The event is continuing. Weekly follow-up reports will be submitted.

Influenza aviaire hautement pathogène ,Zimbabwe

Information reçue le 01/06/2017 de Dr Unesu Hildah Ushewokunze-Obatolu, Principal Director, , Department of Livestock and Veterinary Services, Harare, Zimbabwe

Résumé

Type de rapport	Notification immédiate
Date de début de l'événement	17/05/2017
Date de confirmation de l'événement	01/06/2017
Date du rapport	01/06/2017
Date d'envoi à l'OIE	01/06/2017
Raison de notification	Nouvelle souche d'une maladie listée par l'OIE dans le pays
Agent causal	Virus de l'influenza aviaire hautement pathogène
Sérotype	H5N8
Nature du diagnostic	Tests approfondis en laboratoire (i.e. virologie, microscopie électronique, biologie moléculaire, immunologie)
Cet événement se rapporte à	une zone définie à l'intérieur du pays

Nouveaux foyers

Récapitulatif des foyers	**Nombre total de foyers : 1**					
Localisation du foyer	• MASHONALAND EAST (LANARK, SEKE)					
Nombre total d'animaux atteints	*Espèce(s)*	*Sensibles*	*Cas*	*Morts*	*Mis à mort et éliminés*	*Abattus*
	Oiseaux	2000000	7845	7845	75155	0

Statistiques sur le foyer	*Espèce(s)*	*Taux de morbidité apparent*	*Taux de mortalité apparent*	*Taux de létalité apparent*	*Proportion d'animaux sensibles perdus**

	Oiseaux	0.39%	0.39%	100.00%	4.15%

* Soustraits de la population sensible suite à la mort, à l´abattage et/ou à la destruction;

Epidémiologie

Source du/des foyer(s) ou origine de l´infection	• Inconnue ou incertaine
Autres renseignements épidémiologiques / Commentaires	L'élevage atteint est constitué de huit sites gérés indépendamment et distants d'au moins un kilomètre. Un des huit sites a été atteint, il s'agit d'une unité d'élevage comportant 83 000 volailles de chair parentes. En une semaine, 3045 volailles sont mortes sur ce site en présentant des signes cliniques qui évoquent l'influenza aviaire hautement pathogène. Le site atteint est proche d'un petit barrage où différentes espèces d'oiseaux aquatiques migrateurs sont présentes en nombre ; ces oiseaux sont suspectés d'être à l'origine de l'infection.

Mesures de lutte

Mesures de lutte appliquées	• Restriction des déplacements à l'intérieur du pays • Surveillance à l'extérieur de la zone de confinement ou de protection • Surveillance à l'intérieur de la zone de confinement ou de protection • Dépistage • Traçabilité • Quarantaine • Destruction officielle de tous les produits d'origine animale • Destruction officielle des carcasses, des sous-produits et des déchets • Abattage sanitaire • Zonage • Désinfection • Vaccination interdite • Aucun traitement des animaux atteints
Mesures à appliquer	• Aucune autre mesure

Résultats des tests de diagnostics

Nom du laboratoire et type	Institut vétérinaire Onderstepoort, Afrique du Sud (Laboratoire de réference régional)			
Tests et résultats	*Espèce(s)*	*Test*	*Date du test*	*Résultat*
	Oiseaux	RT-PCR en temps réel	29/05/2017	Positif

	Oiseaux	séquençage viral	01/06/2017 Positif

Rapports futurs

Cet événement se poursuit. Des rapports de suivi hebdomadaires devront être envoyés.

Influenza aviar altamente patógena ,Zimbabue

Información recibida el 01/06/2017 desde Dr Unesu Hildah Ushewokunze-Obatolu, Principal Director, , Department of Livestock and Veterinary Services, Harare, Zimbabue

Resumen

Tipo de informe	Notificación inmediata
Fecha del inicio del evento	17/05/2017
Fecha de confirmación del evento	01/06/2017
Fecha del informe	01/06/2017
Fecha de envio del informe a la OIE	01/06/2017
Motivo de la notificación	Nueva cepa de un agente patógeno de la Lista de la OIE en el país
Agente causal	Virus de la influenza aviar altamente patógena
Serotipo	H5N8
Naturaleza del diagnóstico	Pruebas de diagnóstico de laboratorio avanzadas (ej. virología, microscopía electrónica, biología molecular e inmunología)
Este evento concierne	una zona definida dentro del país

Nuevos focos

Resumen de los focos	**Número total de focos: 1**
Localización	• MASHONALAND EAST (LANARK, SEKE)

del foco						
Número total de animales afectados	*Especies*	*Susceptibles*	*Casos*	*Muertos*	*Matados y eliminados*	*Sacrificados*
	Aves	2000000	7845	7845	75155	0

Estadística del foco	*Especies*	*Tasa de morbilidad aparente*	*Tasa de mortalidad aparente*	*Tasa de letalidad aparente*	*Proporción de animales susceptibles perdidos**
	Aves	0.39%	0.39%	100.00%	4.15%

* Descontados de la población susceptible a raíz de su muerte, destrucción o sacrificio;

Epidemiología

Fuente del o de los focos u origen de la infección	• Desconocida o no concluyente
Otros detalles epidemiológicos / comentarios	La explotación afectada incluye ocho sitios gestionados independientemente a una distancia de al menos un kilómetro. Uno de los ocho sitios se vio afectado, una unidad con 83.000 aves de engorde padres. En una semana, murieron 3.045 aves en ese sitio con signos clínicos que sugerían la influenza aviar altamente patógena. El sitio afectado está cerca de una presa en la que se encuentran diferentes especies de aves acuáticas migratorias; se sospecha que esas aves son el origen de la infección.

Medidas de Control

Medidas implementadas	• Restricción de los movimientos en el interior del país • Vigilancia fuera de la zona de contención o de protección • Vigilancia dentro de la zona de contención o zona de protección • Tamizaje • Trazabilidad • Cuarentena • Destrucción oficial de los productos de origen animal • Eliminación oficial de canales, subproductos y desechos de origen animal • Sacrificio sanitario • Zonificación • Desinfección • Vacunación prohibida • Ningún tratamiento de los animales afectados
Medidas para	• Ninguna otra medida

implementar	

Resultados de las pruebas diagnósticas

Nombre y tipo de laboratorio	Instituto veterinario Onderstepoort, Sudáfrica (Laboratorio de referencia regional)			
Pruebas y resultados	*Especies*	*Prueba*	*Fecha de la prueba*	*Resultados*
	Aves	prueba RT-PCR en tiempo real	29/05/2017	Positivo
	Aves	secuenciación viral	01/06/2017	Positivo

Informes futuros

El episodio continúa. Informes de seguimiento semanales serán enviados

From: Dennis Carroll <dcarroll@usaid.gov>
Sent: Mon, 12 Jun 2017 15:06:41 -0400
To: "Anthony, Simon J." <sja2127@cumc.columbia.edu>
Cc: Tracey Goldstein <tgoldstein@ucdavis.edu>, Andrew Clements <aclements@usaid.gov>, Alisa Pereira <apereira@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, "predict@ucdavis.edu" <PREDICT@ucdavis.edu>
Subject: [predict] Re: Global corona paper published in Virus Evolution

glad to see you were able to offer a balance to Michael Osterholm's singular focus on the very near term

On Mon, Jun 12, 2017 at 2:51 PM, Anthony, Simon J. <sja2127@cumc.columbia.edu> wrote:

> …paper also covered by Amy Maxmen, writing for Nature.
> https://www.nature.com/news/bats-are-global-reservoir-for-deadly-coronaviruses-1.22137

Cheers!
S.

Simon J Anthony, D.Phil
Assistant Professor, Department of Epidemiology
Center for Infection and Immunity, Columbia University

722 West 168th Street, 17th Floor
NY, NY, 10032

Email: sja2127@cumc.columbia.edu
Mobile: REDACTED
Office: 212-342-0558

> On Jun 12, 2017, at 2:43 PM, Dennis Carroll <DCarroll@usaid.gov> wrote:
>
> Thanks for sharing Tracey. Very nice modeling for family level virome. Great basis for GVP to target its work. Kudos

d

On Mon, Jun 12, 2017 at 2:28 PM, Tracey Goldstein <tgoldstein@ucdavis.edu> wrote:

> Dear Andrew, Alisa and Dennis,

Please see attached, good news our paper "Global patterns in coronavirus diversity" was published in Virus Evolution today.

Enjoy, Tracey

--
Tracey Goldstein, PhD
One Health Institute
School of Veterinary Medicine
University of California
Davis, CA 95616
Phone: (530) 752-0412
Fax: (530) 752-3318
E-mail: tgoldstein@ucdavis.edu

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Dr. Dennis Carroll
Director, Emerging Threats Program
Bureau for Global Health
U.S. Agency for International Development

Office: 202-712-5009
Mobile: REDACTED

--

Dr. Dennis Carroll
Director, Emerging Threats Program
Bureau for Global Health
U.S. Agency for International Development

Office: 202-712-5009
Mobile: REDACTED

From: Andrew Clements <aclements@usaid.gov>
To: Brian Bird <bhbird@ucdavis.edu>
CC: Jonna Mazet <jkmazet@ucdavis.edu>
Sent: 7/5/2017 6:10:48 AM
Subject: Re:

Hi Brian,

No problem with the date change.

Regarding funding, I'm okay with saying our intent is to provide similar funding subject to availability of funding.

I'd like to get input from the Mission before finalizing the letter. I have a phone call with them tomorrow.

Andrew

Andrew P. Clements, Ph.D.
Senior Scientific Adviser
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On Jul 4, 2017, at 6:26 PM, Brian Bird <bhbird@ucdavis.edu> wrote:

Andrew,

Only one small edit and one suggestion from my local team. Date of operation in Salone was from 2016 not 2014.

Perhaps slightly more difficult, they also asked if you could make a statement about the anticipated funding level? Would it be "similar" or "consistent with" that originally proposed etc.? It doesn't need an actual figure or anything, but they thought at least a few words around that might be helpful in smoothing the process. I didn't want to pin you down though if not possible to say that at this time.

So, let me know what you think, and I'll reply back with to everyone with either just the small date edit, or also with a general comment on the anticipated funding level.

Thanks!

-brian

From: Andrew Clements <aclements@usaid.gov>
Date: Monday, July 3, 2017 at 4:42 PM
To: "Chittenden, Kendra (Jakarta/Health)" <kchittenden@usaid.gov>, Brian Bird <bhbird@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Khadijat Mojidi <kmojidi@usaid.gov>, Saad Hassan <shassan@usaid.gov>, Dorothy Peprah <dpeprah@usaid.gov>
Cc: "Pereira, Alisa (GH/HIDN)" <apereira@usaid.gov>, Shana Gillette <sgillette@usaid.gov>
Subject: Fwd:

Hi all,

I've drafted a letter related to revising the Predict SLA for Sierra Leone.

Please take a look and let me know if it needs any adjustments.

Thanks!

Andrew

--

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

From: Dennis Carroll <dcarroll@usaid.gov>
Sent: Wed, 10 Jan 2018 16:25:48 -0500
Subject: Re: follow up from yesterday's discussion - WB contact
To: "Sacchetti, Ben" <Sacchetti.Ben@bcg.com>
Cc: [redacted], Jonna Mazet <jkmazet@ucdavis.edu>, "Harris, Samuel" <Harris.Samuel@bcg.com>

Just a quick update. I had an email exchange with Mukesh earlier this week and he is trying to schedule a briefing at the Bank. I would suggest that he could be an excellent contact after we have had a chance for the briefing. Once scheduled it would be good to have BCG present to see who else from the Bank should be engaged.

d

On Wed, Jan 10, 2018 at 4:21 PM, Sacchetti, Ben <Sacchetti.Ben@bcg.com> wrote:

> Thanks [redacted] Would you recommend that we try to schedule a separate conversation with Dr. Chawla, and/or is it more helpful to sit in on the briefing?

Ben Sacchetti
Principal
THE BOSTON CONSULTING GROUP
Mobile +1 3125763838

From: [redacted]
Sent: Wednesday, January 10, 2018 4:00 PM
To: Sacchetti, Ben <Sacchetti.Ben@bcg.com>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>; Dennis Carroll <dcarroll@usaid.gov>
Subject: FW: follow up from yesterday's discussion - WB contact

Hi Ben,

I am sharing information from Dennis regarding a potential collaborator at the World Bank.

Dennis mentioned trying to connect with Dr. Chawla around the holidays in December last year.

Best,

[redacted]

From: Dennis Carroll [mailto:dcarroll@usaid.gov]
Sent: Friday, December 22, 2017 8:50 AM
To: Jonna Mazet <jkmazet@ucdavis.edu>; [redacted]
Subject: follow up from yesterday's discussion - WB contact

Jonna and [redacted] below is Mukesh Chawla's email and a bit of a bio. You can see he is the chief economist at the Bank for the

Pandemic Emergency Financing Facility and CEPI. I will work with him to set up a GVP briefing at the Bank for early in the new year.

mchawla@worldbank.org

Dr. Mukesh Chawla is an Adviser for Health, Nutrition and Population at the World Bank Group and the Coordinator of the Pandemic Emergency Financing Facility.

Chawla has worked for over twenty years with governments and international development partners in Europe, Asia and Africa on a variety of health sector issues, including insurance solutions for global public goods, design and diffusion of complex innovations in health, identification of innovative business solutions to address systemic and process issues in the health sector, and economics of health. His current area of interest and responsibility is helping countries get better prepared to respond immediately and effectively to disease outbreaks that have the potential of assuming pandemic proportions. He has written extensively on the role of markets and market-like institutions in the creation of incentives that strengthen health systems, fiscal space for health, innovations in health financing, design of health sector reforms and economics of aging populations.

Prior to joining the World Bank Group, he held a research faculty position at Harvard University. Before that, as member of the Indian Administrative Service in India, he held several key government positions between the years 1980 and 1998. Chawla attended St. Stephen's College and Delhi School of Economics, Delhi, India, and Boston University, Boston, USA.

--

Dr. Dennis Carroll

Director, Emerging Threats Program

Bureau for Global Health

U.S. Agency for International Development

Office: 202-712-5009

Mobile: REDACTED

--

Dr. Dennis Carroll
Director, Emerging Threats Program
Bureau for Global Health
U.S. Agency for International Development

Office: 202-712-5009
Mobile: REDACTED

From: Peter Daszak <daszak@ecohealthalliance.org>
To: [redacted]
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, Brooke Watson <watson@ecohealthalliance.org>, Hongying Li <li@ecohealthalliance.org>
Subject: RE: Contact from Taiwan, CHN
Sent: Thu, 15 Feb 2018 21:10:48 +0000

Thanks, and I'm cc'ing Hongying on this email so that she can make sure we discuss with George…

Cheers,

Peter

Peter Daszak
President

EcoHealth Alliance
460 West 34th Street – 17th Floor
New York, NY 10001

Tel. +1 212-380-4473
www.ecohealthalliance.org

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.

From: [redacted]
Sent: Thursday, February 15, 2018 3:12 PM
To: Peter Daszak
Cc: Jonna Mazet; Brooke Watson
Subject: Contact from Taiwan, CHN

Hi Peter,

Here is Dr. Hsieh's info, our contact with Taiwan (, CHN) for your conversation with George Gao.

>>
Shie-Liang Edmond Hsieh, MD, D.Phil.

Distinguished Research Fellow
Genomics Research Center
[redacted]

[redacted]

Best,
[redacted]

From: Peter Daszak <daszak@ecohealthalliance.org>
To: [redacted]
Cc: Carlos Morel [redacted], "Subhash (FAORAP) Morzaria [redacted]
<Subhash.Morzaria@fao.org>, "Subhash P Morzaria [redacted] "Ariel Pablos-Mendez" [redacted], Oyewale Tomori [redacted] "ap39@cumc.columbia.edu" <ap39@cumc.columbia.edu>, "Dennis Carroll (DCarroll@usaid.gov)" <DCarroll@usaid.gov>, Nathan Wolfe <nwolfe@metabiota.com>, Jonna Mazet <jkmazet@ucdavis.edu>, Brooke Watson <watson@ecohealthalliance.org>, Cara Chrisman <cchrisman@usaid.gov>, [redacted] Hongying Li <li@ecohealthalliance.org>
Subject: RE: Time Sensitive - another letter to Science about the GVP - Needs your response
Sent: Thu, 22 Mar 2018 17:23:20 +0000

No problem – this is part of the scientific discourse. We don't know yet if they will publish the other technical comment, and it's probable that they'll only publish one of these, if any.

Look forward to comments if you have any, later.

Cheers,

Peter

Peter Daszak
President

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460 West 34th Street – 17th Floor
New York, NY 10001

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@PeterDaszak
@EcoHealthNYC

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.

From: gaof [mailto:gaof@im.ac.cn]
Sent: Thursday, March 22, 2018 1:18 PM
To: Peter Daszak
Cc: Carlos Morel; Subhash (FAORAP) Morzaria (Subhash.Morzaria@fao.org); Subhash P Morzaria [redacted] Ariel Pablos-Mendez; Oyewale Tomori; ap39@cumc.columbia.edu; Dennis Carroll (DCarroll@usaid.gov); Nathan Wolfe; Jonna Mazet; Brooke Watson; Cara Chrisman; REDACTED Hongying Li
Subject: Re: Time Sensitive - another letter to Science about the GVP - Needs your response

Peter
Great job but too much work for you. Agree to be co-authored but comments later.
Does this mean the previous piece will not be published ? What do these guys want ?
Best
George

发自我的 iPhone
在 2018年3月23日, 上午12:37, Peter Daszak <daszak@ecohealthalliance.org> 写道：

Dear Co-authors,

We've now received a 'letter' about our Science paper (see attachment 'aat5918_Other_seq1_vq.doc'). As you'll see, this is from the same authors as the 'Technical Comment' that we already responded to. I checked with *Science*, and

they have asked us to respond, so I drafted a response (attached) which Jonna has helped with. I now need all of you to read the response, then either agree to be an author of that response and send me any edits or comments, or decline to be listed as an author.

Note that we are allowed 600 words maximum and 10 references. We're currently at ~560 words, so please don't add a lot of text!

Also, like the Technical Comment, *Science* editors often will choose not to publish the correspondence, but in this case, if they do it will appear in the journal in print. I've therefore argued back strongly against the points raised by these authors, and made sure to focus the response back onto the GVP (and away from PREDICT), so we get value if it is published.

Please can I ask all of you to respond by email ASAP, and certainly by **5pm Monday March 26th** _

At that point, I'll insert edits, confirm authorship and send this back to *Science* for them to decide on the merits of the discussion, ahead of the deadline.

Cheers,

Peter

Peter Daszak
President

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460 West 34th Street – 17th Floor
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@PeterDaszak
@EcoHealthNYC

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.

<Response to Branco and Garry's letter to Science. Draft.docx>
<aat5918_Other_seq1_v1.docx>

From: Jennifer K Lane <jklane@ucdavis.edu>
To: Yung-Ting Bonnenfant <ybonnenfant@usaid.gov>
Cc: Lisa Kramer <lkramer@usaid.gov>, Woutrina A Smith <wasmith@ucdavis.edu>, hellen Amuguni <Janetrix.Amuguni@tufts.edu>, Innocent Rwego [redacted], Diafuka Saila-Ngita <diafuka.saila_ngita@tufts.edu>, "david.mutonga@thepalladiumgroup.com" <david.mutonga@thepalladiumgroup.com>, Katey Pelican <pelicank@umn.edu>, Nigatu kebede [redacted], Lindsay Parish <lparish@usaid.gov>, Andrea Long-Wagar <alongwagar@usaid.gov>, Alisa Pereira <apereira@usaid.gov>, Ashna Kibria <akibria@usaid.gov>, "Andrew Clements" <aclements@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, "Margaret Morehouse" <mmorehouse@trg-inc.com>, "Tzipori, Saul" <saul.tzipori@tufts.edu>, "Makonnen, Yilma (FAORNE)" [redacted], "Abebe Wolde (P&R)" [redacted], Marilyn Crane <mcrane@usaid.gov>, Innocent Rwego <irwego@umn.edu>, Andrew Kitua <Andrew_Kitua@dai.com>, Thierry Nyatanyi <nthierry@umn.edu>, Ricardo Echalar <rechalar@usaid.gov>, Jeff Bender <bende002@umn.edu>, Susan Scribner [redacted] Amanda Paust <apaust@usaid.gov>, Yirgalem Gebremeskel <ygebremeskel@usaid.gov>, "Woldtsadique, Feleseta (FAOET)" [redacted] "Awoke, Wondwosen (FAOET)" [redacted], Jack Mortenson <jmortenson@usaid.gov>, "VantKlooster, Gijs (FAOET)" [redacted], Simon Heliso <Simonh@jhuccpeth.org>, "Guda Alemayehu" <galemayehu@usaid.gov>, Anton Schneider <aschneider@usaid.gov>
Subject: Re: Ethiopia GHSA biweekly update
Sent: Thu, 3 May 2018 05:24:32 +0000
PREDICT-2GHSA_Ethiopia_BiWeekly_Updates 2 May 2018.docx

Hi Yung-Ting,
Here is the Ethiopia - PREDICT2 biweekly update.

Kind regards, Jennie

Jennie Lane, DVM, MPH
Field Veterinarian
One Health Institute
1089 Veterinary Medicine Dr.
School of Veterinary Medicine
University of California, Davis
email: jklane@ucdavis.edu

> On Apr 30, 2018, at 2:07 PM, Yung-Ting Bonnenfant <ybonnenfant@usaid.gov> wrote:
>
> Dear Ethiopia GHSA colleagues,
> It's time for the biweekly update on GHSA activities in Ethiopia. This update should cover all activities from April 24-May 4. Please use the attached Word document for your updates, and please send in all updates by Wednesday, May 2 COB. Thanks.

Best wishes,

Yung-Ting

Yung-Ting Bonnenfant, PhD, MPH
Global Health Security Technical Advisor
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Entoto Street, P.O. Box 1014
Addis Ababa, Ethiopia
+251.944.74.93.91/+251.111.30.67.63
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<GHSA_Ethiopia_BiWeekly_Updates Template.docx>

Ethiopia GHSA Implementation Bi-Weekly Updates

USAID Implementing Partners

Date Submitted	**02 May 2018**
Project	**PREDICT-2 Ethiopia**

I. Highlighted Updates:

1. Dr. Jennifer Lane and Dr. Grace Mwangoka, global and regional PREDICT-2 lead & members, respectively, are in Addis Ababa providing training for EPHI team and PREDICT-2 Country Coordinator on human syndromic surveillance. The training will continue to Awash and Bati health centres on human syndromic surveillance.
2. Field sample collection was conducted at Bati for wildlife. A total of 17 NHP were sampled using the PREDICT-2 protocol.
3. Laboratory testing activities for viral families have been conducted for bat rectal swab samples that were collected in the Awash area using PREDICT-2 viral family protocols at ALIPB, Addis Ababa University.

II. Coordination:

EPHI and EWCA

III. Challenges:

Supply chain is an ongoing challenge

IV. Upcoming GHSA related TDYs: Please provide the information requested below on all GHSA-related TDYs to Ethiopia for the next six weeks. Insert additional rows as necessary.

Traveler(s)	**Location (areas to be visited)**	**Dates**	**Trip Objectives**	**Trip Impact (including deliverables)** *This should also specify if/how this TDY will build host nation capacity and contributes to overarching GHS objectives*
Jennifer Lane	Addis Ababa	April 30-May 11, 2018	USAID PREDICT-2 and USAID LSIL Young Stock Mortality Project planning with Ethiopia team members for field, lab, and project management activities.	Updated workplans and timelines for conducting fieldwork, lab work, data management, and capacity building activities in Ethiopia.
Grace	Addis Ababa	April 30-May 11, 2018	USAID PREDICT-2 with Ethiopia team members for training on human	Conducting fieldwork, lab work, data management,

			syndromic surveillance that involves field and lab, activities.	and capacity building activities in Ethiopia.

V. <u>Upcoming major GHSA related meetings/trainings/events</u> for the next six weeks (if information is not captured in TDY table above)

Meeting/Training/ Event Topic	Location	Dates	Objectives	Number and type of participants
Training On Human syndromic surveillance	Awash health center	7-9 May 2018	To build the capacity of health professionals on the use of consent forms, human questionnaire, sample collection, processing and storage	5 health professionals
Training On Human syndromic surveillance	Bati health center	14-18 May 2018	To build the capacity of health professionals on the use of consent forms, human questionnaire, sample collection, processing and storage	5 health professionals

From: [redacted]>
To: "Chrisman, Cara (GH/HIDN/ID:AAAS)" <cchrisman@usaid.gov>, Dennis Carroll <dcarroll@usaid.gov>, Peter Daszak <daszak@ecohealthalliance.org>, Eddy Rubin <erubin@metabiota.com>, "nwolfe@metabiota.com" <nwolfe@metabiota.com>, Jonna Mazet <jkmazet@ucdavis.edu>
Subject: GVP call June/July
Sent: Wed, 20 Jun 2018 23:13:37 +0000

Hi everyone,

This is a heads up about our upcoming GVP calls:

- June 21 (tomorrow) – I will not be able to join (on a flight to Saskatoon). Jonna will be calling in, but will boarding a plane during the call.
- June 28 – Dennis and I will be in Japan for outreach activities, and will not be able to join.
- July 19 – Jonna will not be able to join.

Thanks,
[redacted]

From: Andrew Clements <aclements@usaid.gov>
To: Elizabeth Leasure <ealeasure@ucdavis.edu>
CC: David J Wolking <djwolking@ucdavis.edu>;Jonna Mazet <jkmazet@ucdavis.edu>;PREDICTMGT <predictmgt@usaid.gov>
Sent: 7/13/2018 2:26:35 AM
Subject: Realignment of PREDICT budget in Ebola-funded countries

Hi Liz,

I'm checking in to verify that things are on track for PREDICT to provide a realigned Ebola budget across countries so I can discuss with Dennis and Richard while I'm in DC later this month. My recollection is that you had wanted to wait until July so you could add updated information.

My first day in the office will be July 26 so I won't need it until then.

Thanks!

Andrew

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

From: Andrew Clements <aclements@usaid.gov>
Sent: Fri, 10 Aug 2018 12:58:59 -0700
Subject: Re: Smithsonian presentation
To: "Valitutto, Marc" <ValituttoM@si.edu>
Cc: Brooke Genovese <bgenovese@ucdavis.edu>, Alisa Pereira <apereira@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, David John Wolking <djwolking@ucdavis.edu>, "William B. Karesh" <karesh@ecohealthalliance.org>, Cara Chrisman <cchrisman@usaid.gov>, Peter Daszak <daszak@ecohealthalliance.org>, "Murray, Suzan" <MurrayS@si.edu>

...but investigate later options as well.

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Email: aclements@usaid.gov

On Aug 10, 2018, at 9:57 PM, Andrew Clements <aclements@usaid.gov> wrote:

> Thanks, Marc.
> For now, let's keep operating on the assumption that we'll stay with the Sept date.

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On Aug 10, 2018, at 7:45 PM, Valitutto, Marc <ValituttoM@si.edu> wrote:

> Hi All,
> I can check on the castle date availability as well as the scheduled AV support as suggested.
> There is no viewing calendar and all requests are via email, so I'll hope they respond soon.

Marc

--
Marc Valitutto, VMD
(917) 543-6323

Sent from my iPhone

On Aug 10, 2018, at 1:39 PM, Brooke Genovese <bgenovese@ucdavis.edu> wrote:

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on the dates/times above, providing they're worthwhile options for Andrew/Alisa?

-Brooke

From: <[REDACTED]> on behalf of Jonna Mazet <jkmazet@ucdavis.edu>
Date: Friday, August 10, 2018 at 10:31 AM
To: Brooke Genovese <bgenovese@ucdavis.edu>
Subject: Fwd: Smithsonian presentation

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From: **Andrew Clements** <aclements@usaid.gov>
Date: Fri, Aug 10, 2018 at 8:48 AM
Subject: Re: Smithsonian presentation
To: "William B. Karesh" <karesh@ecohealthalliance.org>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, "djwolking@ucdavis.edu" <djwolking@ucdavis.edu>, Peter Daszak <daszak@ecohealthalliance.org>, "MurrayS@si.edu" <MurrayS@si.edu>, "cchrisman@usaid.gov" <cchrisman@usaid.gov>, Alisa Pereira <apereira@usaid.gov>

Thanks, Billy.

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On Aug 10, 2018, at 5:05 PM, William B. Karesh <karesh@ecohealthalliance.org> wrote:

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Subject: Re: Smithsonian presentation
Sent: Fri, 10 Aug 2018 20:44:39 +0000

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Subject: RE: Smithsonian presentation
Sent: Tue, 14 Aug 2018 13:23:40 +0000

Thanks Andrew. I will discuss with the team and get back to you ASAP.

Marc

From: Andrew Clements <aclements@usaid.gov>
Sent: Monday, August 13, 2018 11:56 AM
To: Valitutto, Marc <ValituttoM@si.edu>
Cc: Brooke Genovese <bgenovese@ucdavis.edu>; Alisa Pereira <apereira@usaid.gov>; Jonna Mazet <jkmazet@ucdavis.edu>; David John Wolking <djwolking@ucdavis.edu>; William B. Karesh <karesh@ecohealthalliance.org>; Cara Chrisman <cchrisman@usaid.gov>; Peter Daszak <daszak@ecohealthalliance.org>; Murray, Suzan <MurrayS@si.edu>
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Thanks, Marc. Those two days have similar problems for us.

How does early December look?

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From:	Andrew Clements <aclements@usaid.gov>
To:	Jonna Mazet <jkmazet@ucdavis.edu>
CC:	PREDICTMGT <predictmgt@usaid.gov>;PREDICT-outbreak <predict-outbreak@ucdavis.edu>
Sent:	8/28/2018 1:35:16 PM
Subject:	Re: PREDICT DRC Ebola North Kivu 27 August 2018

Thanks

Andrew P. Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
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On Aug 28, 2018, at 5:54 PM, Jonna Mazet <jkmazet@ucdavis.edu> wrote:

Hello,
This week's report is attached. Notable points are that (1) four EBV positive cases were discharged yesterday after being treated with therapeutic drug MAB114 and (2) a total of 4000+ people have been vaccinated with VSV-ZEBOV.
Best,
Jonna

--

From: Thanat Chookajorn <thanat.cho@mahidol.edu>
Sent: Mon, 29 Oct 2018 07:53:53 +0700
Subject: Meeting in Bali
To: Dennis Carroll <dcarroll@usaid.gov>
Cc: Jonna Mazet <jkmazet@ucdavis.edu>, [redacted]

Dear Dennis,
I would like to thank you and the GVP team again for a wonderful meeting in Thailand. It has the positive impact for both GVP and the Thai research community.

Dean Pratap has the understanding that he will have an opportunity to meet you in Bali. I would like to confirm it with you first. If that is the case, I will prepare a summary for him in advance. Pratap's deanship will end in the middle of 2019. He wants to push the field operation network at TropMed, and a budget either from TropMed or from Mahidol could be allocated for the field work related to GVP.

Have a safe trip and look forward to meeting you in the near future.

Best wishes,
Thanat

From: Cara Chrisman <cchrisman@usaid.gov>
Sent: Mon, 29 Oct 2018 16:18:35 -0400
Subject: Re: Meeting in Bali
To: [redacted]
Cc: thanat.cho@mahidol.edu, Dennis Carroll <dcarroll@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>

Dear Thanat & [redacted],
Thanat, thank you for the kind words, it was such a wonderful opportunity to hear more about all the impressive capacity already pre-existing in Thailand to accomplish this work!

I can further confirm with Dennis tomorrow (in DC), but my understanding is that he will no longer be attending the meeting in Bali. However, I do believe that he will be in the region again soon and there may be another opportunity to have further conversation with Dean Pratap.

Best,
Cara

Cara J. Chrisman, PhD
Senior Infectious Diseases Technical Advisor
U.S. Agency for International Development (USAID) Contractor
Bureau for Global Health, Office of Infectious Disease, Emerging Threats Division
2100 Crystal Drive, CP3-8091A, Arlington, VA 22202
Desk: (571) 551-7413
Cell: [redacted]
E-mail: cchrisman@usaid.gov

GHSI-III - Social Solutions International, Inc. prime contractor

On Mon, Oct 29, 2018 at 2:09 PM [redacted] wrote:

> Dear Thanat,
>
> That is great. I have copied Cara to make sure Dennis sees this message.
>
> Cara, please see Thanat's message below.
>
> Thanks,
>
> [redacted]
>
> [redacted]
> Fellow
> One Health Institute
> School of Veterinary Medicine
> University of California, Davis

From: Thanat Chookajorn [mailto:thanat.cho@mahidol.edu]
Sent: Sunday, October 28, 2018 5:54 PM
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Cc: Jonna Mazet <jkmazet@ucdavis.edu>; [redacted]>
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Dear Dennis,

I would like to thank you and the GVP team again for a wonderful meeting in Thailand. It has the positive impact for both GVP and the Thai research community.

Dean Pratap has the understanding that he will have an opportunity to meet you in Bali. I would like to confirm it with you first. If that is the case, I will prepare a summary for him in advance. Pratap's deanship will end in the middle of 2019. He wants to push the field operation network at TropMed, and a budget either from TropMed or from Mahidol could be allocated for the field work related to GVP.

Have a safe trip and look forward to meeting you in the near future.

Best wishes,

Thanat

From: Andrew Clements <aclements@usaid.gov>
Sent: Mon, 17 Dec 2018 17:34:48 +0100
Subject: Comment from Liberia mission
To: Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Cara Chrisman <cchrisman@usaid.gov>, "Pereira, Alisa (GH/HIDN)" <apereira@usaid.gov>

Hi Jonna,

From the Mission: *"Currently, we are working with partners to develop Liberia's first national plan for animal health surveillance. A key element of that plan includes the capability to early detect, in situ, priority zoonotic viruses, e.g. yellow fever, lassa fever, ebola* et al."*

A) Is Predict aware of the plan being developed?

B) Is Predict contributing to its development?

C) How likely is Liberia to be on the list of Predict extension countries? 100%, high, medium, low, zero.

Thanks!

Andrew

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

From: Andrew Clements <aclements@usaid.gov>
Sent: Wed, 19 Dec 2018 17:10:30 +0100
Subject: Re: Comment from Liberia mission
To: Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Cara Chrisman <cchrisman@usaid.gov>, "Pereira, Alisa (GH/HIDN)" <apereira@usaid.gov>

Thanks, Jonna.

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
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Mobile phone: 1-571-345-4253
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On Wed, Dec 19, 2018 at 4:17 PM Jonna Mazet <jkmazet@ucdavis.edu> wrote:

> Hi Andrew,
> Short answer is yes to both A & B.
>
> More details from Jim:
> *"Charles Oliver is the Infectious disease team lead at the USAID Mission in Liberia ... [he has been] expressing his concern that if PREDICT is not renewed or repackaged as a different program in Liberia, there would be a serious gap in wildlife disease surveillance. At present the PREDICT team is the only group that can safely and humanely capture wildlife and collect high quality samples from the collection point through sample storage while maintaining cold chain.*
>
> *In regard to the National Plan for animal disease surveillance, I am aware and providing input, especially as it relates to zoonotic diseases originating from wildlife. However, we can also comment on the other priority diseases as it relates to domestic animals as well.*
>
> *PREDICT/EHA have played an important role in the development of the One Health Platform from it's inception working closely with the Mission and P&R. Presently, PREDICT is a member of several of the Technical Working Groups that fall under the platform (Surveillance, Laboratory, Workforce Development, and Rabies). In addition, we have been providing technical advice on virtually any zoonoses when an issue arises - this includes Lassa, influenza, scabies, Ebola, rabies and PPR.*
>
> *Compared to the other countries where I have worked on PREDICT, Liberia is without question the country most in need of continued support for wildlife disease surveillance for both workforce development/training and for operational support to continue conducting active surveillance. Before the arrival of PREDICT/EHA in Liberia, there was zero capacity to do this work. At present we have a great team operating through our implementing partner the Society for the Conservation of Nature of Liberia but more capacity building and support is needed in the government sector."*
>
> Let me know if you have any questions or want more follow-up. While we can continue to plan for the Year 6 phase for Liberia, the extension plan won't take care of the surveillance and field capacity concern Jim and Charles are expressing above.
>
> I'm guessing more questions to come,
> Jonna
>
> On Mon, Dec 17, 2018 at 8:57 AM Andrew Clements <aclements@usaid.gov> wrote:
>
> > Thanks. Send me A and B whenever he's available.
>
> Presumably he be in Monrovia in 2019 in time for the release of the findings.
>
> Andrew Clements, Ph.D.
> Senior Scientific Advisor

Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
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Mobile phone: 1-571-345-4253
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For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

On Mon, Dec 17, 2018 at 5:48 PM Jonna Mazet <jkmazet@ucdavis.edu> wrote:

> Hi Andrew,
> Jim has been working with the government a bunch, but we'd like him to give us the details on involvement in this specific plan.
> He's en route to New York at the moment, so we can get back to you tomorrow with info on A&B. I would say high likelihood on C.
> Happy Holidays,
> Jonna

On Mon, Dec 17, 2018 at 8:35 AM Andrew Clements <aclements@usaid.gov> wrote:

> Hi Jonna,

From the Mission: *"Currently, we are working with partners to develop Liberia's first national plan for animal health surveillance. A key element of that plan includes the capability to early detect, in situ, priority zoonotic viruses, e.g. yellow fever, lassa fever, ebola* et al."*

A) Is Predict aware of the plan being developed?

B) Is Predict contributing to its development?

C) How likely is Liberia to be on the list of Predict extension countries? 100%, high, medium, low, zero.

Thanks!

Andrew

Andrew Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

From: Sudarat Damrongwatanapokin <sdamrongwatanapokin@usaid.gov>
To: Katherine Leasure <kaleasure@ucdavis.edu>
CC: Andrew Clements <aclements@usaid.gov>;PREDICTMGT <predictmgt@usaid.gov>;Predict inbox <predict@ucdavis.edu>;Jonna Mazet <Jkmazet@ucdavis.edu>;Daniel Schar <dschar@usaid.gov>;MarcousMA@state.gov <MarcousMA@state.gov>
Sent: 1/31/2019 5:38:53 PM
Subject: Re: Change to Approved ITA - P. Daszak (Add Malaysia)

Noted, thank you. We also cc Macous regarding Peter's TDY in Malaysia for his awareness and possible request for in-country or out-country brief.

Best,
Sudarat

Best regards,
Sent from my mobile.

> On Feb 1, 2019, at 4:21 AM, Katherine Leasure <kaleasure@ucdavis.edu> wrote:
>
> 7526

From:	Peter Daszak <daszak@ecohealthalliance.org>
To:	Jonna Mazet <jkmazet@ucdavis.edu>
CC:	David J Wolking <djwolking@ucdavis.edu>;predict@ucdavis.edu" <predict@ucdavis.edu>;Evelyn Luciano <luciano@ecohealthalliance.org>;Molly Turner <turner@ecohealthalliance.org>
Sent:	2/6/2019 12:09:35 PM
Subject:	Leilani and Sr. Behav. Risk Coord. justification

Jonna,

Do you want us to draft up a short (one para) justification for the plans re. not filling the Sr. Behav. Risk Coord. Position using the original USAID RFA position criteria?

Cheers,

Peter

Peter Daszak
President

EcoHealth Alliance
460 West 34th Street – 17th Floor
New York, NY 10001

Tel. +1 212-380-4474
Website: www.ecohealthalliance.org
Twitter: @PeterDaszak

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.

From: Elizabeth Leasure <ealeasure@UCDAVIS.EDU>
To: Andrew Clements <aclements@usaid.gov>
Cc: Amalhin Shek <ashek@usaid.gov>, Alisa Pereira <apereira@usaid.gov>, Jonna Mazet <jkmazet@ucdavis.edu>, predict Sympa List <predict@ucdavis.edu>, Hannah R Chale <hrchale@UCDAVIS.EDU>, Lindsay Parish <lparish@usaid.gov>
Subject: PREDICT Ebola Financial Report for January 2019
Sent: Mon, 4 Mar 2019 16:56:48 +0000
PREDICT Ebola Financial Report_Jan2019_final.pdf

Hi Andrew. Please find attached the PREDICT Ebola financial report for January 2019. Please let me know if you have any questions.

Thanks!
Liz

Elizabeth Leasure
Financial Operations Manager
One Health Institute
REDACTED
530-754-9034 (office)
Skype: ealeasure

PREDICT-2 Expenses - Ebola

January 2019

Cost Category	*US Central*	*Cameroon*	*Cote d'Ivoire*	*DRC*	*Ethiopia*	*Ghana*	*Guinea*	*Kenya*	*Liberia*
Salaries	*8,604*	*22,915*	*20,800*	*15,265*	*21,195*	*48,825*	*16,603*	*15,029*	*4,346*
Fringe	*3,446*	*8,992*	*7,588*	*4,824*	*8,811*	*4,401*	*6,513*	*5,091*	*1,462*
Equipment	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Domestic Travel	*4,415*	*548*	*104*	*26*	*104*	*26*	*12,500*	*356*	*0*
Foreign Travel	*0*	*117*	*194*	*250*	*117*	*56*	*5*	*59*	*6,391*
Services	*305*	*1,305*	*1,305*	*752*	*1,305*	*326*	*0*	*652*	*105,222*
Supplies	*5,803*	*0*	*0*	*0*	*0*	*550*	*2,423*	*0*	*0*
Other	*3,730*	*9,815*	*1,975*	*1,866*	*2,110*	*14,605*	*36,238*	*988*	*10,856*
Indirects	*12,436*	*20,891*	*14,448*	*10,055*	*17,272*	*18,980*	*23,532*	*7,464*	*10,314*
Total Costs	**$38,738**	**$64,583**	**$46,413**	**$33,038**	**$50,915**	**$87,769**	**$97,814**	**$29,639**	**$138,590**

Cost Category	*Senegal*	*Sierra Leone*	*Tanzania*	*Uganda*
Salaries	*29,904*	*19,407*	*45,377*	*22,804*
Fringe	*9,468*	*5,200*	*17,880*	*10,287*
Equipment	*0*	*0*	*0*	*0*
Domestic Travel	*2,226*	*18,855*	*7,443*	*4,517*
Foreign Travel	*1,159*	*896*	*117*	*117*
Services	*1,305*	*0*	*1,305*	*1,731*
Supplies	*0*	*2,106*	*0*	*325*
Other	*24,212*	*29,822*	*15,839*	*53,681*
Indirects	*19,876*	*21,762*	*23,915*	*15,045*
Total Costs	**$88,150**	**$98,048**	**$111,877**	**$108,506**

$994,082 PREDICT-2 Costs (Ebola)

From: Andrew Clements <aclements@usaid.gov>
Sent: Thu, 2 May 2019 00:06:56 +0200
Subject: Re: Change to PREDICT Group ITA - Semi-Annual Meeting Vancouver (Cancel Bird/Leasure)
To: Katherine Leasure <kaleasure@ucdavis.edu>
Cc: PREDICTMGT <predictmgt@usaid.gov>, Predict inbox <predict@ucdavis.edu>, Jonna Mazet <Jkmazet@ucdavis.edu>

Thanks

Andrew P. Clements, Ph.D.
Senior Scientific Advisor
Emerging Threats Division/Office of Infectious Diseases/Bureau for Global Health
U.S. Agency for International Development
Mobile phone: 1-571-345-4253
Email: aclements@usaid.gov

On May 1, 2019, at 2:28 PM, Katherine Leasure <kaleasure@ucdavis.edu> wrote:

> Hi Andrew. The previously approved travel for Brian Bird and Elizabeth Leasure to Vancouver for the Semi-Annual Meeting was cancelled. Brian had a schedule conflict that prevented him from attending, and Liz was unable to locate her passport and did not have time to obtain a replacement before the meeting. Please let me know if you have any questions. Thanks!
>
> *Travel Request*:
> PREDICT-2 requests approval for the individuals listed in the attached spreadsheet to travel from their respective departure locations to Vancouver, Canada to participate in the PREDICT Semi-Annual Meeting to be held April 30 to May 1.
>
> **Trip purpose:** Strategic planning for successful wind down and closeout of the PREDICT-2 award; meeting deliverables and planning risk communication campaigns for host country partners; final report planning.
> --

Katherine Leasure
HR/Payroll/Financial Assistant
One Health Institute
530-752-7526

From: Lisa Kramer <lkramer@usaid.gov>
Sent: Wed, 15 May 2019 23:24:53 +0300
Subject: Re: DRC CBS interview: Predict input no longer required
To: Kirsten Gilardi <kvgilardi@ucdavis.edu>
Cc: Andrew Clements <aclements@usaid.gov>, PREDICTMGT <predictmgt@usaid.gov>, Katherine Leasure <kaleasure@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, David John Wolking <djwolking@ucdavis.edu>

Hi Kirsten,
The interview is still in all likelihood not going to work, but discussions are still bubbling. There's a slim chance that we could get a last minute request for you to do the interview. If that happens and Andrew gives the OK, would you be willing to make a last minute change in your schedule to go to Goma early next week? If so, you would need to restart things with your DRC visa Guru. Again, this would be rushing to get the visa for something that is likely to not happen, but could be fantastic press exposure if it does happen.
Lisa

Lisa Kramer
Regional Emerging Pandemic Threats Advisor
USAID/Kenya and East Africa
+254-20-363-2107 (Office)
+ REDACTED (Mobile)

On Tue, May 14, 2019 at 11:20 PM Kirsten Gilardi <kvgilardi@ucdavis.edu> wrote:

> Okay, no problem. I'll let my DRC visa guru know that this is likely off — if anything changes in the next 48 hours, please let me know! -K
>
> > On May 14, 2019, at 4:18 AM, Andrew Clements <aclements@usaid.gov> wrote:

Ok, so it's now off again so please cancel Kirsten's plans for DRC. Sorry for the confusion--we have no say in the erratic decision-making process.

Andrew Clements, Ph.D.
Senior Scientific Advisor
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Mobile phone: 1-571-345-4253
E-mail: aclements@usaid.gov

For more information on USAID's Emerging Pandemic Threats program, see: http://www.usaid.gov/ept2

From: [redacted]
To: David John Wolking <djwolking@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Woutrina A Smith <wasmith@ucdavis.edu>, Christine Kreuder Johnson <ckjohnson@UCDAVIS.EDU>, Tracey Goldstein <tgoldstein@ucdavis.edu>, Brian H Bird <bhbird@ucdavis.edu>, Bridgette Phebean Smith <brpsmith@ucdavis.edu>, Catherine Machalaba <machalaba@ecohealthalliance.org>, William Karesh <karesh@ecohealthalliance.org>, Kristin Burns <kburns@ucdavis.edu>, Matthew Blake <mblake@ucdavis.edu>, Eunah Regina Cho <eecho@ucdavis.edu>
Subject: FW: WHO One Health course on "Basics of multisectoral collaboration at the Human - Animal - Environment interface
Sent: Wed, 29 May 2019 18:22:09 +0000
image001.png
image005.png
image007.png

Hi everyone,

Sharing a message from my colleague at WHO HQ regarding their new online One Health course.

Best,
[redacted]

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

Subject: WHO One Health course on "Basics of multisectoral collaboration at the Human - Animal - Environment interface

Dear colleagues,

It is with great pleasure that we share the WHO One Health course on "Basics of multisectoral collaboration at the Human - Animal - Environment interface".

What is the course about ?

This 90' online course is free and geared to professionals from human, animal or environmental health sectors involved in the implementation of the International Health Regulations (2005). The current course language is English and translation in French and other languages are in the pipeline. The course is divided into three main modules followed by a final quiz and certification upon successful completion. Have a watch on its nice teaser! You can also get a taste of the course on your phone by scanning the QR code with your camera.

How to access the course?
You can sign up for the course on the WHO Health Security Learning Platform here.

Where can I find more material on One Health?
In case you want to access more advanced material on One Health or you are training on One Health yourself, please also check out the teaser for our 3-5 day One Health training package that includes ready-to-use PowerPoints with many more case studies, interviews and quizzes. The full material is available for download here.

How can I support One Health?
Spread the word about the course by sharing this email, the teasers and the links to the course and the training packages with your network!
Additionally, you are free to use some of the following key messages:

- A well trained #OneHealth workforce is needed to effectively address complex health challenges. Learn about the basics of One Health in the WHO #OneHealthCourse.
- A #OneHealth approach is crucial to build national mechanisms to address health threats at the human-animal-environment interface. Learn how in the WHO #OneHealthCourse.
- The WHO #OneHealthCourse can be used to fill specific gaps in national capacities by staff involved in the implementation of the International Health Regulations (2005)

Again, my sincere thanks to all of the colleagues that contributed to make this course become reality, namely the One Health team at WHO Geneva as well as the Learning Solutions and Training Team at WHO Lyon!

Best regards,

Stella

--

REDACTED

From:	Jonna Mazet <jkmazet@ucdavis.edu>
To:	AOTR/Grant Manager Andrew Clements <AClements@usaid.gov>
CC:	Predict inbox <predict@ucdavis.edu>;Alisa Pereira <apereira@usaid.gov>;Cara Chrisman <cchrisman@usaid.gov>;Corina Grigorescu Monagin <cgmonagin@ucdavis.edu>
Sent:	6/11/2019 6:57:36 AM
Subject:	Guinea finding release complexities

Dear Andrew,
Just a note in advance of our call to let you know that we are still up in the air on a release date for the Guinea finding. The complexity has nothing to do with our work or the acceptance or quality of the finding. There are some country capacity and confidence issues that we can discuss today that are holding up action. In any case, our team, the Mission, and key people at Ministry of Health are all on the same page that the finding should be released ASAP. We had hoped to have some more solid info for you by now, but in the absence of a decision on the ground, we thought we should give you a process update.

For clarification and emphasis and in support of the MoH decision, we sent the attached letters (versions in French and English for your reference). A few details also below for your reference.

Background on activities in Guinea related to the PREDICT finding:

After discussion and acceptance of the PREDICT finding and general consensus that it should be released, the MoH/ANSS made a request to our team to analyze the duplicate VTM samples in-country. Those samples are currently stored in the Viral Hemorrhagic Fever Laboratory (VHF) in Conakry. Our PREDICT team met with Dr. Sakoba of the ANSS on Friday May 31st with the signed letter stating our position that we don't recommend duplicate analyses be completed at the VHF for multiple reasons including biosafety and biosecurity concerns, as well as the potential that a duplicate analysis from another swab will not replicate the same result (attached: "Lettre Dr. Sakoba").

We then sent another signed letter to Dr. Sakoba on Monday June 3rd (letter dated May 31) with outcomes of the Friday meeting (attache: "Reponse Sakoba"):

- Confirmation that Dr. Sakoba received the letter stating our position on the testing of the VTM samples in the VHF lab
- Sakoba requested that PREDICT release the information publicly, and we have asked him to provide us with written confirmation of this request
- PREDICT will continue to engage with the Government of Guinea on how to proceed regarding the duplicate VTM samples but support may take time (no immediate action)
- PREDICT will continue planned activities that include community engagement but will not release the information to the public, as we believe that the country should get the information first

Dr. Sakoba put a suspension on all activities related to the retesting of the VTM samples and we are waiting for further feedback.

Talk to you soon,

Jonna

Davis le 30/05/2019

Réf: PREDICT/Guinee/UCD/300519

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID
One Health Institute
School of Veterinary Medicine
University of California Davis
1089 Veterinary Medicine Drive
Davis, CA 95616, USA
Mobile: +1.415.741.6996

A Monsieur le Directeur Général de l'ANSS
S/C de son excellence Monsieur le Ministre de Santé, Conakry, Guinée

Subject: Confirmation Test for Positive Samples

Dear Sir,

In regards to the positive detection of *Bombali ebolavirus* in Guinea, we acknowledge your request to analyze the duplicate samples located in the VHF lab that are associated with the positive bats. The PREDICT-2 project has worked over the past three years collaboratively with you and the Guinean Government and we will continue to respect the regulations and requests of our Government colleagues. Because safety is of primary importance in this work, we encourage you to please take into consideration our technical guidance as outlined below.

For the PREDICT project we collected samples in duplicate, one stored in in Trizol and one in Viral Transport Media (VTM). Trizol lysis buffer inactivates any infectious virus that may be present in a sample and renders the sample non-infectious and non-hazardous. It is a common procedure to handle and process samples stored in Trizol in BSL-2 laboratories such as the University of California, Davis Laboratory and the VHF Guinea Laboratory to avoid any exposure of laboratory technicians to potential high-risk pathogens.

At the University of California, Davis Laboratory the Trizol samples were tested using five assays: 1) a filovirus 'family level'consensus PCR assay to detect all filoviruses, 2) an *Ebolavirus* 'genus level' assay to detect all ebolaviruses; 3) two real-time PCR assays specific for Zaire ebolavirus; 4) a real-time PCR assay we designed specifically to test for Bombali ebolavirus. We detected Bombali virus in samples from two different bats using the "family level" filovirus PCR assay and the real time PCR assay specific for Bombali. Positive samples were sequenced to confirm the presence of the Bombali virus. The samples **did not** test positive with the Zaire ebolavirus tests.

It is important to note that the duplicate samples from these positive animals that are currently located at the Guinea VHF laboratory are stored in VTM. ***These samples are potentially infectious and should be handled and processed following protocols for Ebola virus infected biological materials.*** Typically, these types of samples are processed for testing in Biosafety Level 4 (BSL-4) laboratories following strict biosafety and biosecurity practices. We highly recommend that you consider transfer of these samples to the BSL-4 capable laboratory of your choice to inactivate the samples and then return them to the VHF Guinea laboratory so that all subsequent testing can be performed safely at BSL-2.

If you choose to proceed with testing and sample processing at the VHF Guinea laboratory the duplicate VTM samples must be first inactivated safely following your laboratories standard operation procedures (SOPs) to safely and effectively process them without risk to laboratory personnel. We highly recommend the use at a minimum a protective bio-bubble with HEPA filtered air and a biosafety cabinet and personnel wearing PPE suitable for handling live Ebola virus infected materials (for example double gloves, Tyvek suits, face and eye protection, and respiratory protection – N95 mask or equivalent) and follow all required procedures for worker safety and decontamination.

It is very important to note that commercially available tests for *Zaire ebolavirus*, and the other medically important filoviruses (Sudan, Bundibugyo, Marburg viruses etc.) such as the Cepheid GeneXpert ***WILL NOT*** detect Bombali virus. At UC Davis we have developed two tests that can detect Bombali virus – one is the consensus PCR assay already transferred to the VHF Laboratory, and the second is a highly specific and sensitive real-time PCR assay for Bombali virus detection. Both assays, followed by viral sequencing should be performed to test the duplicate VTM samples.

It is also important to note that two samples taken from the same animal may give different laboratory results. This is a well-established scientific principle and is influenced greatly by the amount of virus present at the time of sample collection (virus load), sample storage conditions, and sample buffer stability. Therefore, results from the VHF laboratory tests using the VTM samples may differ from the results of the Trizol samples at the University of California, Davis Laboratory.

We thank you for your cooperation and continued support. We are happy to continue to provide technical assistance with these assays.

Regards,

Corina Monagin, MPH, DrPH

Guinea Global Lead PREDICT Project of USAID

One Health Institute

School of Veterinary Medicine

University of California Davis

1089 Veterinary Medicine Drive

Davis, CA 95616, USA

Mobile: +1.415.741.6996

Davis le 31/05/2019

Réf: PREDICT/Guinee/UCD/310519

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID
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Davis, CA 95616, USA
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A Monsieur le Directeur Général de l'ANSS
S/C de son excellence Monsieur le Ministre de
Santé, Conakry, Guinée

Objet: Test de Confirmation de l'échantillon positif

Monsieur,

Pr. Alpha Oumar Camara, le Coordinateur Pays du Projet PREDICT Guinée, nous a fait le compte rendu verbal de votre entretien après lecture de la lettre qui vous a été adressée de notre part. Nous vous remercions d'avance pour votre compréhension et l'esprit de franche collaboration que vous nous réservez.

Il nous a été dit que nous pouvons publier le résultat (dans notre revue scientifique type ProMed, media écrit et autres). Nous vous prions de nous faire parvenir votre accord dans la lettre réponse à notre correspondance du 30/05/2019.

Aussi dans le cadre de notre partenariat et surtout dans la poursuite de notre engagement auprès du Gouvernement Guinéen, nous sommes ouvert à une discussion sur comment supporter le laboratoire de FHV durant cette procédure. Étant donné que nous ne sommes pas dans une urgence sanitaire face à ce résultat scientifique, nous sollicitons que vous nous accorder le temps de finir avec l'analyse des échantillons restant dans le laboratoire Davis au cas où il y a d'autres échantillons positifs.

Par ailleurs, PREDICT va continuer de s'engager avec les communautés sur comment vivre en toute sécurité avec les chauves-souris. En aucun cas, nous ne partagerons la découverte du nouveau virus avec les communautés sans votre accord.

Nous vous remercions de votre collaboration et de votre soutien continu. Nous restons à votre disposition tout moment.

Cordialement,

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID

Davis le 30/05/2019

Réf: PREDICT/Guinee/UCD/300519

Corina Monagin, MPH, DrPH
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A Monsieur le Directeur Général de l'ANSS
S/C de son excellence Monsieur le Ministre de Santé, Conakry, Guinée

Objet: Test de Confirmation de l'échantillon positif

Monsieur,
En ce qui concerne la découverte du virus Ebola Bombali en Guinée, nous accusons réception de votre demande pour analyser les duplicatas des échantillons positifs situés dans le laboratoire FHV de Guinée. Le projet PREDICT-2 a travaillé en collaboration avec le gouvernement Guinéen au cours des trois dernières années et nous continuerons à respecter la réglementation et les demandes du Gouvernement. Étant donné l'importance primordiale de la sécurité dans ce que nous faisons, nous vous encourageons à prendre en compte notre point de vue technique sur le sujet.

Dans le cadre du projet PREDICT, nous avons collecté des échantillons en double, l'un stocké dans un milieu de transport viral ou VTM et l'autre dans du Trizol. Le Trizol est un buffer qui inactive tout virus infectieux présent dans un échantillon et le rend non infectieux inoffensif. Les échantillons stockés dans du Trizol sont normalement analysés dans des laboratoires BSL-2 tels que l'Université de Californie Davis et le Laboratoire FHV de Guinée, afin d'éviter toute exposition de techniciens de laboratoire à des agents pathogènes potentiellement à haut risque.

Dans le laboratoire de l'Université de Californie, Davis, les échantillons de Trizol ont été testés par cinq tests : 1) un test PCR général de filovirus permettant de détecter tous types de filovirus, 2) un test spécifique au genius d'Ebolavirus permettant de détecter tous les virus Ebola; 3) Deux PCR en temps réels spécifiques à l'ébolavirus Zaire 4) une PCR en temps réel spécifiques au Bombali Ebola virus. Nous avons détecté le virus Bombali dans des échantillons provenant de deux chauves-souris différentes via PCR «au niveau de la famille» et d'une PCR en temps réel spécifique au Bombali virus. Les échantillons positifs ont été séquencés pour confirmer la présence du virus Bombali. Les échantillons ne sont pas positifs au virus Ebola Zaïre.

Il est important de noter que les copies des échantillons des animaux positifs se trouvant actuellement dans le laboratoire FHV sont stockés dans du VTM. Ces échantillons sont potentiellement infectieux et doivent être manipulés conformément aux protocoles applicables aux produits biologiques infectés par le virus Ebola. En règle générale, ces échantillons sont traités dans des laboratoires de niveau de Biosécurité 4 (BSL-4), conformément à des pratiques strictes en matière de biosécurité et de biosureté. Nous vous recommandons vivement d'envisager de transférer ces échantillons dans le laboratoire de

votre choix doté de la capacité BSL-4 afin de les inactiver, puis de les renvoyer au laboratoire VHF Guinée afin que tous tests ultérieurs puissent être effectués en toute sécurité dans un BSL-2.
Si vous choisissez de procéder aux tests et au traitement des échantillons dans le laboratoire FHV, les copies des échantillons dans le VTM doivent d'abord être inactivés en toute sécurité, conformément aux procédures d'utilisation standard (SOP) de votre laboratoire, afin de les traiter de manière sûre et efficace, sans risque pour le personnel de laboratoire. Nous recommandons vivement d'utiliser un bio-bubble avec un filtre HEPA, une armoire de biosécurité et un équipement de protection individuelle pour le personnel apte à manipuler du matériel vivant infecté par le virus Ebola (par exemple, gants doubles, combinaisons Tyvek, protection du visage et des yeux et protection respiratoire - masque N95 ou équivalent) et de suivre toutes les procédures requises pour la sécurité et la décontamination des travailleurs.

Il est très important de noter que les tests disponibles pour le virus Ebola Zaïre et autres filovirus connus (virus Sudan, Bundibugyo, Marburg, etc.) tels que Cepheid GeneXpert NE DÉTECTERONT PAS le virus Bombali. Au laboratoire de UC Davis, nous avons mis au point deux tests capables de détecter le virus Bombali: un consensus PCR déjà transférée au laboratoire VHF, et le second qui est une PCR en temps réel extrêmement spécifique et sensible pour la détection du virus Bombali. Ces deux tests, suivis d'un séquençage viral, doivent être réalisés pour tester les copies des échantillons de VTM.

Il est également important de noter que deux échantillons prélevés sur un même animal peuvent donner des résultats de laboratoire différents. Ceci est un principe scientifique bien établi, fortement influencé par la quantité de virus présente au moment du prélèvement de l'échantillon (charge virale), les conditions de stockage de l'échantillon et la stabilité de la mémoire tampon de l'échantillon. Par conséquent, les résultats des tests de laboratoire FHV utilisant les échantillons VTM peuvent différer de ceux des échantillons Trizol du laboratoire de l'Université de Californie, à Davis.

Nous vous remercions de votre collaboration et de votre soutien continu. Nous restons à votre disposition tout moment.

Cordialement,

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID

Davis le 31/05/2019

Réf: PREDICT/Guinee/UCD/310519

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID
One Health Institute
School of Veterinary Medicine
University of California Davis
1089 Veterinary Medicine Drive
Davis, CA 95616, USA
Mobile: +1.415.741.6996

A Monsieur le Directeur Général de l'ANSS
S/C de son excellence Monsieur le Ministre de
Santé, Conakry, Guinée

Subject: Confirmation Test for Positive Samples

Sir,
Pr. Alpha Oumar Camara, Country Coordinator of PREDICT Guinea Project, reported to us about the meeting he had with you about the letter that you received from us. We thank you in advance for your understanding and the spirit of frank collaboration that you have with us.

We were told that we can publish the result (in standard scientific journal such as ProMed, written media or others). We would like your written agreement in the reply letter to our correspondence of 30/05/2019.

Also, as part of our partnership and especially in the pursuit of our commitment to the Guinean Government, we are open to any discussion on how to support the VHF laboratory during this procedure of confirmation test. Since we are not in a health emergency with this scientific result, we request that you give us the time to finish with the analysis of the remaining sample in the UC Davis laboratory in case there will be other positive samples.

For the moment, PREDICT will continue risk communication and community engagement on how to live safely with bats. In any case, we will not share the discovery of the new virus with communities without your agreement.

We thank you for your cooperation and continued support. We remain available for you at any time.

Regards,

Cmonagin

Corina Monagin, MPH, DrPH
Guinea Global Lead, PREDICT Project of USAID

From: Peter Daszak <daszak@ecohealthalliance.org>
To: [redacted], "dibesh@cmdn.org" <dibesh@cmdn.org>, Ariful Islam <arif@ecohealthalliance.org>, Jon Epstein <epstein@ecohealthalliance.org>, Hongying Li <li@ecohealthalliance.org>, "ckjohnson@ucdavis.edu" <ckjohnson@ucdavis.edu>, Emily Hagan <hagan@ecohealthalliance.org>, Thomas Hughes <tom.hughes@ecohealthalliance.org>, Allison White <white@ecohealthalliance.org>, Kevin Olival <olival@ecohealthalliance.org>, Alice Latinne <latinne@ecohealthalliance.org>, [redacted] "tgoldstein@ucdavis.edu" <tgoldstein@ucdavis.edu>, "dmciver@metabiota.com" <dmciver@metabiota.com>, "ssilithammavong@metabiota.com" <ssilithammavong@metabiota.com>, "dveasna@pasteur-kh.org" <dveasna@pasteur-kh.org>, [redacted] "afine@wcs.org" <afine@wcs.org>, "solson@wcs.org" <solson@wcs.org>, "jpi-pssp@indo.net.id" <jpi-pssp@indo.net.id>, "eshiilegdamba@wcs.org" <eshiilegdamba@wcs.org>, Ava Sullivan <sullivan@ecohealthalliance.org>, [redacted] Debapriyo Chakraborty <chakraborty@ecohealthalliance.org>, [redacted], "murrays@si.edu" <murrays@si.edu>, "valituttoM@si.edu" <valituttoM@si.edu>, Patrick Dawson <dawson@ecohealthalliance.org>, [redacted], "ghazi@human-link.org" <ghazi@human-link.org>, "William B. Karesh" <karesh@ecohealthalliance.org>, "abubasha@just.edu.jo" <abubasha@just.edu.jo>, "jayukekbong@metabiota.com" <jayukekbong@metabiota.com>, "mmouiche@mosaic.cm" <mmouiche@mosaic.cm>, "Anne Laudisoit" <laudisoit@ecohealthalliance.org>, "ksaylors@metabiota.com" <ksaylors@metabiota.com>, "pmulembakani@metabiota.com" <pmulembakani@metabiota.com>, [redacted] <e[redacted], "utamoufe@metabiota.com" <utamoufe@metabiota.com>, "kvgilardi@ucdavis.edu" <kvgilardi@ucdavis.edu>, [redacted], "djwolking@ucdavis.edu" <djwolking@ucdavis.edu>, "zikankubasijali@gmail.com" <zikankubasijali@gmail.com>, [redacted], "kalpyjuliencoulibaly@pasteur.ci" <kalpyjuliencoulibaly@pasteur.ci>, [redacted] "trkelly@ucdavis.edu" <trkelly@ucdavis.edu>, "cmonagin@ucdavis.edu" <cmonagin@ucdavis.edu>, "jabelkhiria@ucdavis.edu" <jabelkhiria@ucdavis.edu>, [redacted] "Jim Desmond" <desmond@ecohealthalliance.org>, "cmonagin@ucdavis.edu" <cmonagin@ucdavis.edu>, "jabelkhiria@ucdavis.edu" <jabelkhiria@ucdavis.edu>, "daouda.ndiaye@ucad.edu.sn" <daouda.ndiaye@ucad.edu.sn>, [redacted] "bhbird@ucdavis.edu" <bhbird@ucdavis.edu>, "ZimmermanD@si.edu" <ZimmermanD@si.edu>, "jkamau@primateresearch.org" <jkamau@primateresearch.org>, [redacted] "wasmith@ucdavis.edu" <wasmith@ucdavis.edu>, "jklane@ucdavis.edu" <jklane@ucdavis.edu>, "jkmazet@ucdavis.edu" <jkmazet@ucdavis.edu>
Cc: Alison Andre <andre@ecohealthalliance.org>, Aleksei Chmura <chmura@ecohealthalliance.org>, "predict@ucdavis.edu" <predict@ucdavis.edu>, Noam Ross <ross@ecohealthalliance.org>
Subject: New PREDICT Emerging Disease Insight on SADS-CoV
Sent: Thu, 25 Jul 2019 16:23:52 +0000
EDI SADS-Cov.pdf

Dear PREDICT global team leads, regional leads and country coordinators,

I'm happy to share with you the latest Emerging Disease Insights (EDIs) document on SADS-Cov from our PREDICT Modeling and Analytics Team. This latest EDI incorporates comments from the Executive Board and can be shared widely to interested groups.

Cheers,

Peter

Peter Daszak
President

EcoHealth Alliance
460 West 34th Street – 17th Floor
New York, NY 10001

Tel. +1 212-380-4474
Website: www.ecohealthalliance.org
Twitter: @PeterDaszak

EcoHealth Alliance leads cutting-edge scientific research into the critical connections between human and wildlife health and delicate ecosystems. With this science, we develop solutions that prevent pandemics and promote conservation.

EMERGING DISEASE INSIGHTS

Research from the PREDICT Modeling & Analytics team

Extensive overlap of three SADS-CoV bat hosts within intensive pig farming regions in Asia

In October 2016, a novel coronavirus, swine acute diarrhea syndrome coronavirus (SADS-CoV) was discovered at commercial swine farms in Guangdong Province, China[1]. The death of nearly 25,000 piglets was attributed to infection with SADS-CoV, a virus of likely bat-origin as very closely-related CoVs have been identified in *Rhinolophus* spp. horseshoe bats (*R. affinis*, *R. sinicus*, *R. pusillus*, and *R. rex*) roosting in caves near infected farms.

SADS-CoV threatens commercial pig populations at bat-pig interfaces where other viral pathogens (e.g. Nipah, Menangle, and Ebola Reston viruses) also have been found. It is therefore critical to identify geographic areas with the greatest potential for bat-pig transmission to mitigate the risk of SADS-CoV and other viral spillover and to prioritize surveillance. Here we use spatial analyses to identify areas of greatest risk of SADS-CoV emergence across China and Southeast Asia by modeling the distribution of key *Rhinolophus* host species and their overlap with commercial pig farms.

Regions of Greatest Overlap

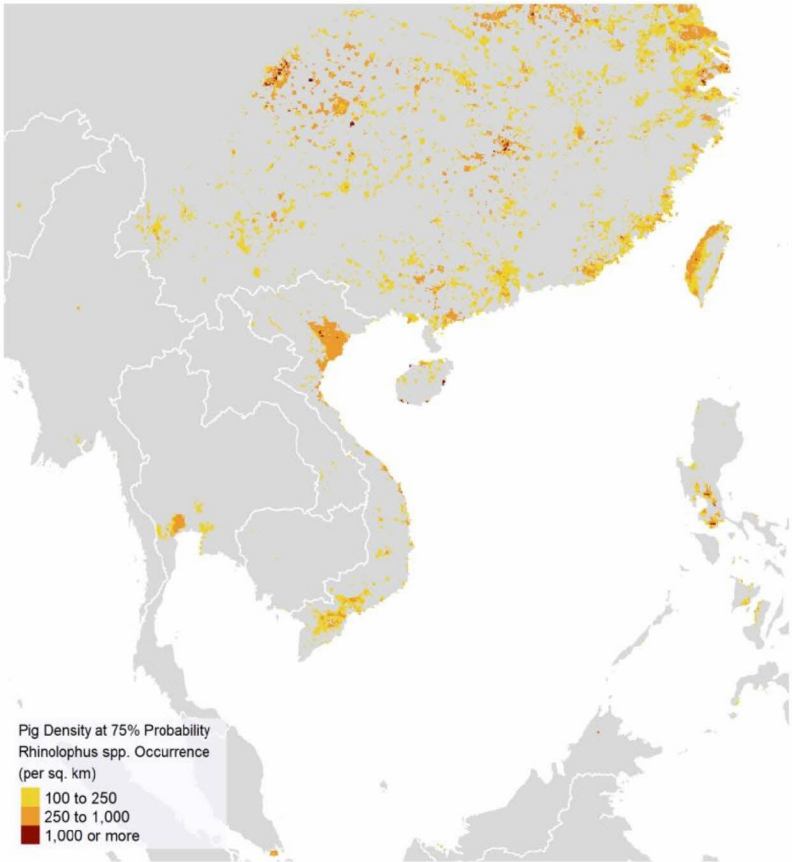

Figure 1. Areas of bat-pig overlap where probability of SADS-CoV *Rhinolophus* spp. reservoir occurrence is high (>75%) and pig densities are indicative of intensive pig farming (>100 pigs per km^2).

For details on methods or analysis contact: PREDICTmodeling@ecohealthalliance.org

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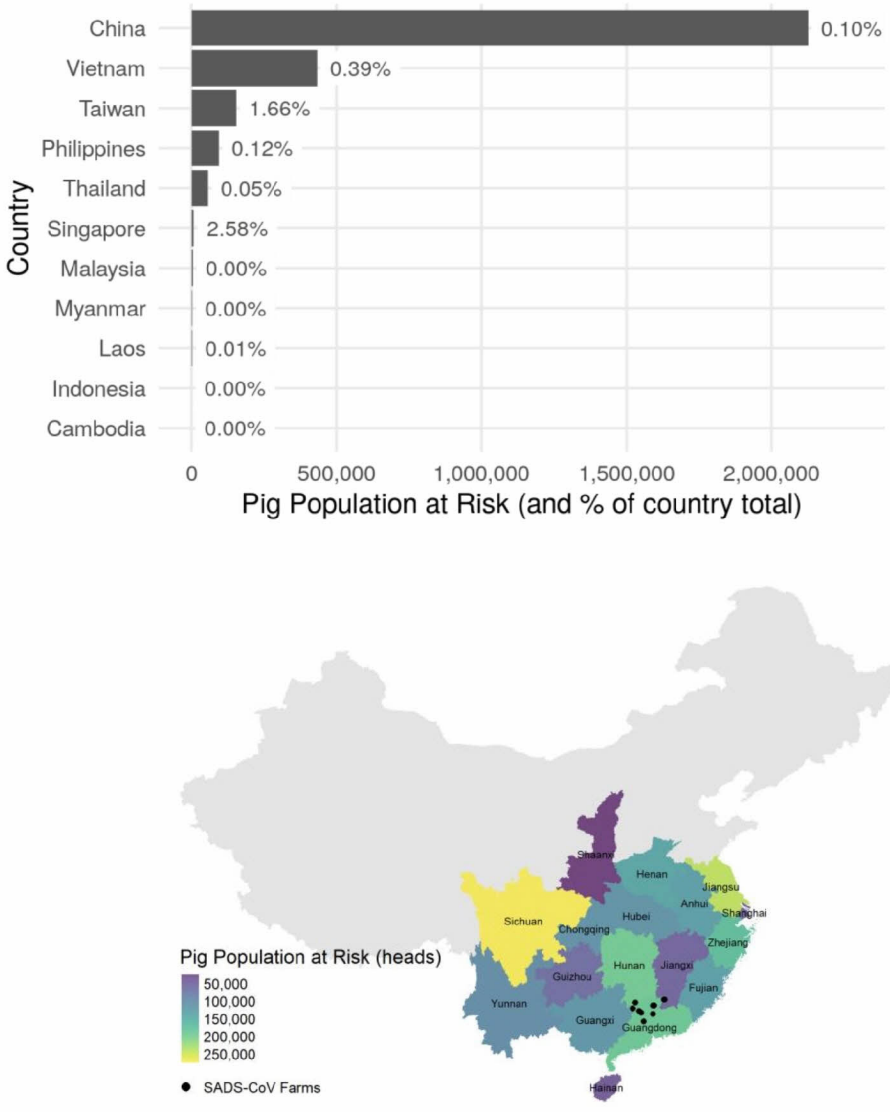
The largest areas of spatial overlap among SADS-CoV host species and pig farms are localized mainly to Southern China (including Taiwan), throughout Vietnam, the Philippines, and Thailand. Compared to other countries, China had the largest area of bat-pig overlap with 330,000 km² (3.4% of total country area with a density of >100 pigs per km²) and 2,130,000 pigs located within predicted bat distributions. By Chinese province, the largest area of overlap was found in Jiangsu (242,000 pigs over an area 35,200 km² amounting to 34.3% of the province's area). Sichuan had the largest pig population at risk: 274,000 pigs over 26,000 km² (5.4% of the total area of the province).

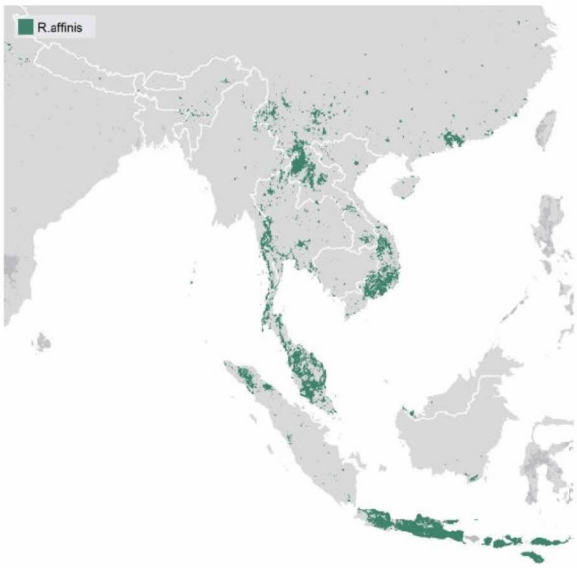
Conclusion: This analysis uses the best available science to identify key regions where the likelihood of SADS-CoV spillover is highest. It allows better geographic targeting of future research to understand SADS-CoV and interventions to block spillover across the pig-bat interface.

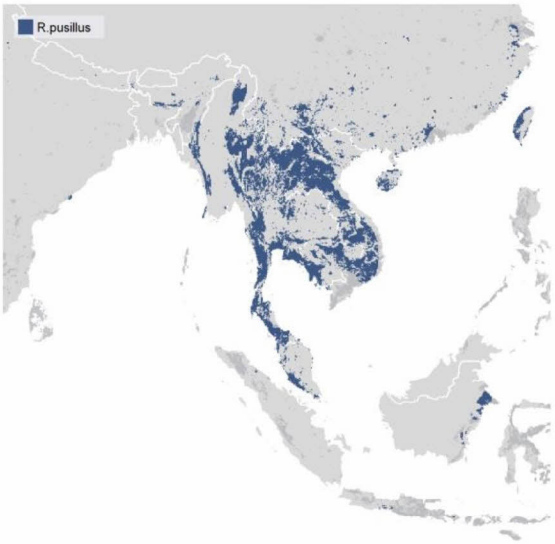


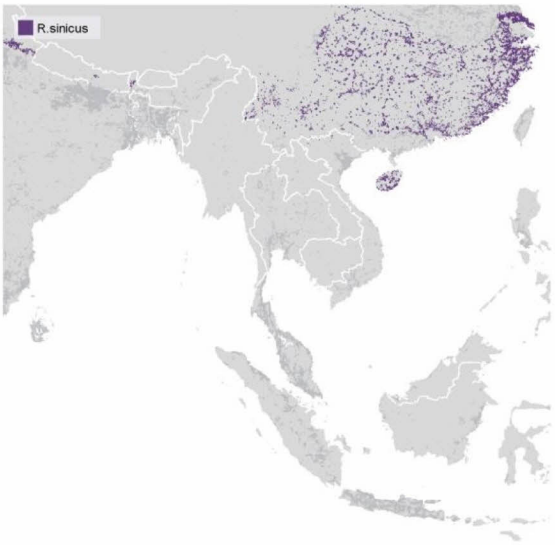
Figures 2-3. Total pig population at risk by country (and percentage of total), and by Chinese province. Pig population at risk is defined by the number of pigs within an area that intersects with predicted bat occurrence. Among China's 2,130,000 pigs in spatial overlap areas, Sichuan and Jiangsu provinces each had over 200,000 pigs in areas of SADS-CoV spillover risk.

Species Distribution Modeling

The PREDICT-2 Modeling & Analytics team used MaxEnt to create species distribution models for *Rhinolophus affinis*, *R. pusillus*, and *R. sinicus*, potential hosts implicated in the initial SADS-CoV spillover event. There were insufficient occurrence records to model the species distribution for *R. rex*, the fourth bat species in which SADS-CoV was previously detected[1]. Occurrence records for each host species were derived from PREDICT-1, PREDICT-2, and NIAID 1R01AI110964 data, and the Global Biodiversity Information Facility (GBIF). Fourteen bioclimatic variables from BIOCLIM, land cover type, karst landscapes, night time lights, and human population density were inputs for the model. Predictive accuracy was high for the best-fitting models, with mean AUC values of 0.82 (R. affinis), 0.80 (R. pusillus), and 0.72 (R. sinicus).







Figures 4-6. Species distribution models of *R. affinis*, *R. pusillus*, and *R. sinicus* projected to IUCN species range extents (colored), and predicted distributions outside of IUCN range in grey. These bat species distribution models were used to map bat-pig overlap in Figure 1.

References

1. Zhou P, Fan H, Lan T, Yang XL, Shi WF, Zhang W, et al. Fatal acute diarrhoea syndrome caused by an HKU-2 related coronavirus of bat origin. Nature. 2018; 556(7700):255-258. doi: 10.1038/s41586-018-0010-9.

2. Proosdij ASJ, Sosef MSM, Wieringa JJ, Raes N. Minimum required number of specimen records to develop accurate species distribution models. Ecography. 2015; 39(6):542-552. doi: 10.1111/ecog.01509.

3. Duan R, Kong XQ, Huang MY, Fan WY, Wang ZG. The predictive performance and stability of six species distribution models. PLoS One. 2014; 9(11). doi: 10.1371/journal.pone.0112764. Pig populations and spatial distributions were drawn from the FAO Gridded Livestock of the World 2.0.[4]

4. Robinson TP, Wint GRW, Conchedda G, Van Boeckel TP, Ercoli V, Palamara E, et al. (2014) Mapping the Global Distribution of Livestock. PLoS ONE 9(5): e96084. doi: 10.1371/journal.pone.0096084

From: Dennis Carroll <dcarroll@usaid.gov>
Sent: Wed, 14 Aug 2019 16:36:13 -0400
Subject: Re: URGENT - request to rescheduled GVP call -tomorrow
To: Peter Daszak <daszak@ecohealthalliance.org>
Cc: "cchrisman@usaid.gov" <cchrisman@usaid.gov>, "jkmazet@ucdavis.edu" <jkmazet@ucdavis.edu>, [redacted], Samtha Maher <maher@ecohealthalliance.org>, "erubin@metabiota.com" <erubin@metabiota.com>, "nwolfe@metabiota.com" <nwolfe@metabiota.com>

Im available. Thanks Peter

d

Dr. Dennis Carroll
Director, Emerging Threats Program
Bureau for Global Health
U.S. Agency for International Development
Office: 571-551-7109
Mobile: 3 REDACTED

NOTE: I will leave USAID on August 30, 2019. Afterwards I can be contacted at:

personal email: [redacted]
personal mobile: REDACTED

On Wed, Aug 14, 2019 at 3:28 PM Peter Daszak <daszak@ecohealthalliance.org> wrote:

> Everyone – I just realized that we're on for a GVP call tomorrow at 1pm Eastern, but I have a meeting from 12-3pm Eastern with a group of Board-related people here in the office that I can't duck out of and that's been scheduled for weeks.
>
> Could we re-schedule for any time between 3 and 6pm Eastern or even later would work for me?
>
> Many apologies for the last minute request!!
>
> Cheers,
>
> Peter

Peter Daszak

President

EcoHealth Alliance

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New York, NY 10001

Tel. +1 212-380-4474

Website: www.ecohealthalliance.org

Twitter: @PeterDaszak

EcoHealth Alliance leads cutting-edge research into the critical connections between human and wildlife health and delicate ecosystems. With this science we develop solutions that prevent pandemics and promote conservation.

From: Google Calendar [mailto:calendar-notification@google.com] **On Behalf Of** cchrisman@usaid.gov
Sent: Thursday, August 1, 2019 10:33 AM
To: jkmazet@ucdavis.edu; REDACTED Samtha Maher; erubin@metabiota.com; cchrisman@usaid.gov; Peter Daszak; dcarroll@usaid.gov; nwolfe@metabiota.com
Subject: GVP call - Agenda

Hi All,

Looking forward to speaking today, it's been too long! We have a relatively short agenda today, please see below.

Best,
Cara

- Thailand
- Berkeley meeting + GVP side mtg
- MacArthur
- AOB

GVP call

When Thu Aug 1, 2019 1pm – 2pm Eastern Time - New York

Where call in line REDACTED, passcode REDACTED (map)

Who
- watson@ecohealthalliance.org - organizer
- cchrisman@usaid.gov
- REDACTED
- jkmazet@ucdavis.edu

- nwolfe@metabiota.com
- erubin@metabiota.com
- dcarroll@usaid.gov
- Peter Daszak

Sent: Wed, 22 Apr 2020 21:33:04 +0000
Subject: Invitation: SWOT Interview (SEAOHUN Board Members): Suwat Chariyalre... @ Thu Apr 30, 2020 6am - 7am (PDT) (jkmazet@ucdavis.edu)
From: [redacted]
To: jkmazet@ucdavis.edu, Peter Daszak <daszak@ecohealthalliance.org>, suwat@rihes.org, sfh9@georgetown.edu, alexandrazuber@atahealthstrategies.com
invite.ics

You have been invited to the following event.

SWOT Interview (SEAOHUN Board Members): Suwat Chariyalrertsak

When Thu Apr 30, 2020 6am – 7am Pacific Time - Los Angeles

Where [redacted]

Calendar jkmazet@ucdavis.edu

Who
- [redacted] - organizer
- Peter Daszak
- jkmazet@ucdavis.edu
- suwat@rihes.org
- sfh9@georgetown.edu
- alexandrazuber@atahealthstrategies.com

more details »

Dear Dr. Chariyalertsak,
We are delighted that you volunteered to participate in an interview. I will be sending the interview questions in the coming days, for your reference.

As a reminder, this interview is not for research purposes. This interview is part of a larger data gathering exercise by the global team, which is designed to summarize the perspectives of SEAOHUN Secretariat Staff, OHUN country coordinators, and Executive and Foundation Board members on the strengths, weaknesses, opportunities and threats ("SWOT") facing SEAOHUN's organizational sustainability. The purpose is to inform the SEAOHUN Business Plan that is required for submission to USAID at the end of Year 1 of the OHW-NG initiative. For that reason, I hope you feel very comfortable throughout the interview and ask questions or add comments as you would like.

With your permission, I'd like to record the interview, so myself and a global team member can transcribe the comments and make sure we don't miss anything. This recording will be maintained in my Zoom account, and can be viewed only by select global team members working on this activity.

We will consolidate findings from this exercise in to a presentation for SEAOHUN Secretariat staff in the coming weeks, to assist us to prioritize activities to build AFROHUN's organizational capacity over Year 1. We will not attribute any comments to you as an individual, but rather to "a SEAOHUN Board member".

Call details are below. Feel free to email me with any questions.
Alexandra Zuber is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting
[redacted]

REDACTED

Dial by your location
+1 312 626 6799 US (Chicago)
+1 646 558 8656 US (New York)
+1 253 215 8782 US
+1 301 715 8592 US
+1 346 248 7799 US (Houston)

+1 669 900 6833 US (San Jose)

REDACTED

Going (jkmazet@ucdavis.edu)? **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

You are receiving this email at the account jkmazet@ucdavis.edu because you are subscribed for invitations on calendar jkmazet@ucdavis.edu.

To stop receiving these emails, please log in to https://www.google.com/calendar/ and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to send a response to the organizer and be added to the guest list, or invite others regardless of their own invitation status, or to modify your RSVP. Learn More.

Sent: Thu, 7 May 2020 14:21:48 -0700
Subject: Fwd: Thank you & decent scientific reporter
From: Jonna Mazet <jkmazet@ucdavis.edu>
To: Josh Cohen <jcohen@clarencedyer.com>

---------- Forwarded message ---------
From: **Jonna Mazet** <jkmazet@ucdavis.edu>
Date: Thu, Mar 26, 2020 at 3:01 PM
Subject: Thank you & decent scientific reporter
To: 石正丽 <zlshi@wh.iov.cn>
Cc: Peter Daszak <daszak@ecohealthalliance.org>, Hongying Li <li@ecohealthalliance.org>

Dear Zheng-Li,
Just a note to thank you for your amazing work and service to the world. We are all honored to have you as a colleague and collaborator, and I hope your days there are okay and you are staying well.

I know you are swamped with reporter requests and all of the other things related to the pandemic. If you are making choices about which reporter requests to respond to, I just wanted to give thumb's up to Tim Vernimmen, who is the science writer working for the online popular science magazine Knowable, which is published by Annual Reviews (AR) in order to communicate the science to a wider audience and is currently working on a story about the One Health approach. I just did an interview with him & he is really going for the scientific angle, as well as value of the One Health approach. I think he has reached out to you. I told him that you might be too busy to answer, so I suggested that if that is the case, Hongying could potentially speak with him.

Just let us know if we can be of support to you & know that we are grateful to you,
Jonna

Jonna AK Mazet, DVM, MPVM, PhD
Professor of Epidemiology & Disease Ecology
Executive Director, One Health Institute
Director, One Health Workforce – Next Generation of USAID Emerging Threats Division
Director Emeritus, PREDICT Project of USAID Emerging Threats Division

School of Veterinary Medicine
University of California, Davis
onehealthinstitute.net

Institute for Global Health Sciences
University of California, San Francisco
https://globalhealthsciences.ucsf.edu/

For scheduling and logistical issues, please contact:
Ms. Mary Radford
maradford@ucdavis.edu
+1-530-752-3630

From: "Tammie O'Rourke" <[redacted]
Sent: Tue, 4 Aug 2020 10:36:57 -0700
Subject: Re: Action Plan for Indonesia Government Report Approval
To: Ava Sullivan <sullivan@ecohealthalliance.org>
Cc: David Wolking <djwolking@ucdavis.edu>, Christine Kreuder Johnson <ckjohnson@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Imung Joko PAMUNGKAS <jpi-pssp@indo.net.id>, Tracey Goldstein <tgoldstein@ucdavis.edu>, Kevin Olival <olival@ecohealthalliance.org>, Aleksei Chmura <chmura@ecohealthalliance.org>, Peter Daszak <daszak@ecohealthalliance.org>

Hi Ava,
Thanks for the update. Just to clarify, the deadline for the data approvals is August 30th. I need the month of September to work on getting all the data into the DDL before the end of September.
Many thanks,
Tammie

On Mon, Aug 3, 2020 at 12:15 PM Ava Sullivan <sullivan@ecohealthalliance.org> wrote:

> Hello,
> Below is the agreed upon action plan for achieving approval of the Indonesia viral results. Imung, thank you for your previous and multiple past attempts to gain approval through changes in points of contact, varying agendas, and other challenges. We also appreciate your understanding that we are up against a hard deadline of the end of September, a deadline which includes Tammie getting the data into the DDL, so we have even less time than that to gain approval itself.

I have looped in the above group so that we can document this effort and ensure all are aware of the ongoing efforts. We are also here as resources if you run into challenges as we enact this plan over the next few weeks. We look forward to resolving this issue.

Thanks,
Ava

Action Plan for Indonesia Government Report Approval:

1) IP to discuss with Deputy DG to ascertain

   a. Nature of delay at DG level (active, or passive?)

   b. If we can get final sign off from Director level, instead of DG

   c. If so, available times to schedule meeting with Director, otherwise with DG

2) IP to schedule a presentation with Dr. drh. I Ketut Diamita, Director General of Livestock and Animal Health Services at the Ministry of Agriculture and relevant director level leadership

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i. (eg timeline could include: 'Two-week review period after the presentation. If we do not hear back, the results will be considered approved)

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a. Eg (If the in-person meeting cannot be made within two weeks with the DG, a zoom meeting between IP and the Deputy DG and any other relevant leadership will move forward, and a recording of results sharing presentation will be shared and given a 2 week review period.)

4) KJO/AS will share this plan with UCD on Monday

Ava Sullivan
Project Manager and Research Assistant

EcoHealth Alliance
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New York, NY 10018
607-280-7669 (mobile)
www.ecohealthalliance.org

EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation

--
Tammie O'Rourke
Labyrinth Global Health
Systems Integrator
Emerging Pandemic Threats - PREDICT Program
tel +1-250-618-2460

From: "Tammie O'Rourke" [redacted]
Sent: Tue, 11 Aug 2020 07:27:10 -0700
Subject: Re: Action Plan for Indonesia Government Report Approval
To: JoKo Pamungkas <jpi-pssp@indo.net.id>
Cc: Ava Sullivan <sullivan@ecohealthalliance.org>, David Wolking <djwolking@ucdavis.edu>, Christine Kreuder Johnson <ckjohnson@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Tracey Goldstein <tgoldstein@ucdavis.edu>, Kevin Olival <olival@ecohealthalliance.org>, Aleksei Chmura <chmura@ecohealthalliance.org>, Peter Daszak <daszak@ecohealthalliance.org>

Thank-you so much for the update Joko, we really appreciate your efforts. Good luck with your meeting.
Tammie

On Tue, Aug 11, 2020 at 3:36 AM JoKo Pamungkas <jpi-pssp@indo.net.id> wrote:

> Dear All,
> First of all, I personally send my apology for all the delay in getting the reports approved for release by the Indonesian authority. Despite of how hard I've been trying to pursue through the DG, all ended up with no success. I take and consider this as my failure as country coordinator in approaching the DG, from whichever angles I have tried. Once again I apologized.
>
> Last week, after so many trials in contacting the Direktur Kesehatan Hewan/ Dirkeswan (Director of Animal Health, one echelone level under the DG) finally I was able to speak with him on the phone and pushed him to accepting my request to sign the data release approval. It wasn't easy either to convince him that he could sign the approval, instead of the DG. One rationale or objection that he used and persisted in avoiding it was because according to the Indonesia's Law #41 from year 2014, the national veterinary authority is at the DG level. I made him convinced that for PREDICT global consortium it will not matter, so finally he agreed, and further decided that the presentation that I will need to make is to be done Thursday this week. That was from our whatsapp messages exchange last week following our phone conversation, and only today I had the official letter from him for the event (attached).
>
> I will try my best to get the approval by the end of this month as reminded by Tammy. Thank you all for your patience and continuous supports.
>
> Best regards,
> Imung.

Dr. drh. Joko Pamungkas, MSc.
- Senior Scientist, Primate Research Center
- Associate Professor, Faculty of Veterinary Medicine

[redacted]

> On 5 Aug 2020, at 00.37, Tammie O'Rourke [redacted] wrote:
>
> Hi Ava,
> Thanks for the update. Just to clarify, the deadline for the data approvals is August 30th. I need the month of September to work on getting all the data into the DDL before the end of September.

Many thanks,
Tammie

On Mon, Aug 3, 2020 at 12:15 PM Ava Sullivan <sullivan@ecohealthalliance.org> wrote:

> Hello,
> Below is the agreed upon action plan for achieving approval of the Indonesia viral results. Imung, thank you for your previous and multiple past attempts to gain approval through changes in points of contact, varying agendas, and other challenges. We also appreciate your understanding that we are up against a hard deadline of the end of September, a deadline which includes Tammie getting the data into the DDL, so we have even less time than that to gain approval itself.

I have looped in the above group so that we can document this effort and ensure all are aware of the ongoing efforts.
> We are also here as resources if you run into challenges as we enact this plan over the next few weeks. We look forward to resolving this issue.

Thanks,
Ava

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From: Christine Kreuder Johnson <ckjohnson@UCDAVIS.EDU>
To: Kevin Olival <olival@ecohealthalliance.org>, Joko PAMUNGKAS <jpi-pssp@indo.net.id>
Cc: Ava Sullivan <sullivan@ecohealthalliance.org>, Tammie O'Rourke [REDACTED], David John Wolking <djwolking@ucdavis.edu>, Jonna Mazet <jkmazet@ucdavis.edu>, Tracey Goldstein <tgoldstein@ucdavis.edu>, Aleksei Avery Chmura <chmura@ecohealthalliance.org>, Peter Daszak <daszak@ecohealthalliance.org>
Subject: Re: Action Plan for Indonesia Government Report Approval
Sent: Wed, 12 Aug 2020 18:37:57 +0000

Imung,
We greatly appreciate the update on these efforts. We realize that the test results pending approval are the vast majority of findings from Indonesia over the past 5 years and we need approval by Aug 30 to ensure compliance with USAID activities in participating countries. Thanks to Kevin for his work with you - do not hesitate to let us know if there is anything we can do to help ensure a positive outcome for the meeting.
Warmest regards,
/Chris

From: Kevin Olival <olival@ecohealthalliance.org>
Date: Tuesday, August 11, 2020 at 2:41 PM
To: Joko PAMUNGKAS <jpi-pssp@indo.net.id>
Cc: Ava Sullivan <sullivan@ecohealthalliance.org>, Tammie O'Rourke [REDACTED] David John Wolking <djwolking@ucdavis.edu>, Christine Kreuder Johnson <ckjohnson@UCDAVIS.EDU>, Jonna Mazet <jkmazet@ucdavis.edu>, Tracey Goldstein <tgoldstein@ucdavis.edu>, Aleksei Chmura <chmura@ecohealthalliance.org>, Peter Daszak <daszak@ecohealthalliance.org>
Subject: Re: Action Plan for Indonesia Government Report Approval

Thank you very much for the update Imung. Despite the obstacles, I appreciate your persistence with this important issue.

As we discussed, I'll be sure to work with you over the next 1-2 days to review the presentation for Thursday and help however else needed to facilitate the Director signing off on our PREDICT wildlife findings.

Best regards,
Kevin

Kevin J. Olival, PhD
Vice President for Research

EcoHealth Alliance
520 Eighth Avenue, Suite 1201
New York, NY 10018

1.212.380.4478 (direct)
[REDACTED] (mobile)
1.212.380.4465 (fax)
www.ecohealthalliance.org
EcoHealth Alliance develops science-based solutions to prevent pandemics and promote conservation.

On Aug 11, 2020, at 12:35 AM, JoKo Pamungkas <j[REDACTED] wrote:

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- Associate Professor, Faculty of Veterinary Medicine

REDACTED

REDACTED

REDACTED

<Undangan penyampaian laporan PREDICT-2.pdf>

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From: "Minicucci, Charles" <CMinicucci@nas.edu>
To: 'Amy Pruden' <apruden@vt.edu>, "'andre@ecohealthalliance.org'" <andre@ecohealthalliance.org>, "'Barton Behravesh, Casey (CDC/OID/NCEZID)'" <dlx9@cdc.gov>, "'daszak@ecohealthalliance.org'" <daszak@ecohealthalliance.org>, 'David Rizzo' <dmrizzo@ucdavis.edu>, "'[redacted]', "'[redacted]'" <[redacted]>, 'Geraldine Neville' <gneville@tulane.edu>, "'Hermsen, Elizabeth D'" <elizabeth.hermsen@merck.com>, "'Hughes, James M'" <jmhughe@emory.edu>, 'John Parrish-Sprowl' <johparri@iupui.edu>, "'Jonna Mazet'" <jkmazet@ucdavis.edu>, "'kevin.anderson@dhs.gov'" <kevin.anderson@dhs.gov>, 'Mary Radford' <maradford@ucdavis.edu>, "'mary_wilson@harvard.edu'" <'mary_wilson@harvard.edu'>, "'mewilson@hsph.harvard.edu'" <mewilson@hsph.harvard.edu>, "'Miller, Sally'" <miller.769@osu.edu>, "'mlichtve@tulane.edu'" <mlichtve@tulane.edu>, "'MUMFORD, Elizabeth'" <mumforde@who.int>, "'Rushton, Jonathan'" <[redacted]>, "Pavlin, Julie" <JPavlin@nas.edu>, "Thevenon, Audrey" <AThevenon@nas.edu>
Cc: '[redacted]>, "Goodtree, Hannah" <HGoodtree@nas.edu>, "Berger, Kavita" <KBerger@nas.edu>, "Sylvina, Teresa" <TSylvina@nas.edu>
Subject: OHAC Call #23
Sent: Thu, 27 Aug 2020 13:37:00 +0000
OHAC OHW Survey Illustrations Sept 2020.docx
OHAC Mtg 23 Agenda_FINAL.docx

Hello all,

Please find attached to this calendar update the agenda for the call and some results illustrations from the One Health workers survey, which Jonna will discuss during the meeting. We will also be joined by three prospective collaborators from other areas of NASEM: Kavita Berger, the new director of the Board on Life Sciences; Teresa Sylvina, the director of the Strategic Initiatives for Animal Research; and Audrey Thevenon, who is heading up a new rapid strategic science initiative for COVID-19 response.

See you all next week! Thanks,

Charlie

Join from PC, Mac, Linux, iOS or Android:

Would you like to test your Zoom connection? Please click on the link below.
https://nasem.zoom.us/test

NOTICE: The Zoom service allows audio and any materials exchanged or viewed during the session to be recorded and shared. Please be aware that by participating in this activity, you consent to your voice, likeness, and any materials you provide, being recorded for use and dissemination, without payment of any compensation for such use, in any language, format, or media now known or later devised, and you release the National Academies of Sciences, Engineering, and Medicine from any and all claims, liability, or damages arising from any such use. The Academies will proceed in reliance upon such consent and

release. If you do not consent to the foregoing, please do not join the session.

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

FORUM ON MICROBIAL THREATS

ONE HEALTH ACTION COLLABORATIVE (OHAC) MEETING #23

Thursday, September 3rd, 2020
1:00-2:00pm (ET)

PARTICIPANTS

MEMBERS:
Jonna Mazet (*Chair*), Peter Daszak, Gail Hansen, Elizabeth Hermsen, Maureen Lichtveld, Sally Miller, Liz Mumford, John Parrish-Sprowl, Amy Pruden, and Dave Rizzo,
Tentative/Absent: Kevin Anderson, Casey Barton Behravesh, Jim Hughes, Jonathan Rushton, and Mary Wilson

STAFF:
Julie Pavlin, Julie Liao and Charlie Minicucci (Forum on Microbial Threats)
Kavita Berger, Director, Board on Life Sciences, Division of Earth and Life Sciences
Teresa Sylvina, Director, Strategic Initiatives on Animal Research and Institute for Laboratory Animal Research
Audrey Thevenon, Program Officer, Board on Life Sciences

MEETING MATERIALS

- One Health Workers survey results

AGENDA ITEMS

1. Welcome & General Check-in (Jonna)
2. Food safety deliverable (Sally and Dave)
    - Updates on subcommittee
    - Updates on One Health Outlook submission
3. One Health and state and local medical associations (Gail)
    - Updates on subcommittee
    - Op-ed submission update
4. One Health Workforce deliverable update (Jonna; attachment)
5. Other One Health efforts at the National Academies (Kavita and Teresa)
6. Other brief updates
    - Feedback on past workshop: "The Critical Public Health Value of Vaccines – Tackling Issues of Access and Hesitancy" (Julie)
    - Upcoming workshop: "Systematizing the One Health Approach in Preparedness and Response Efforts for Infectious Disease Outbreaks"
    - World One Health Congress side meeting
    - Items from OHAC members
7. Next steps and action items (Julie)
    - Developing the next deliverable – consider Behavior Change?
    - OHAC Meeting #24

Figure 1. Categorization of eligible respondents (n=896) who participated in the survey

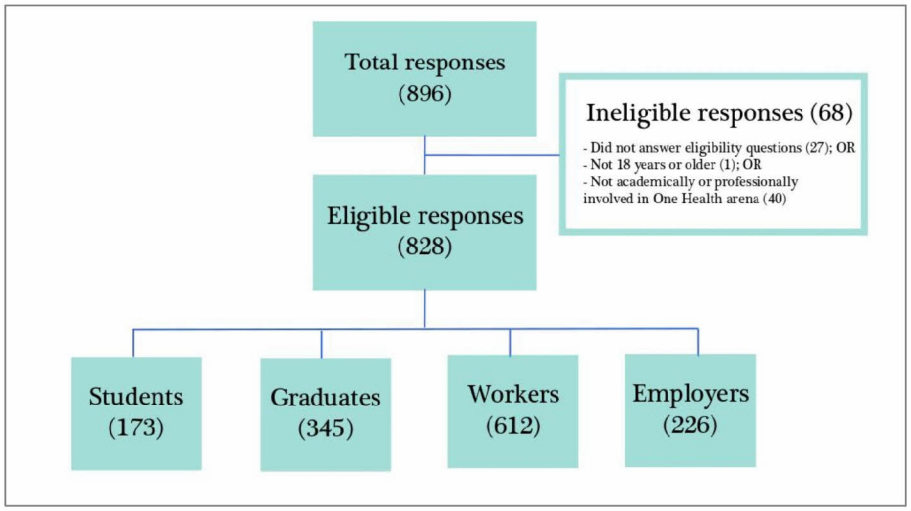


Figure 2. Countries (n=66) represented by survey respondents

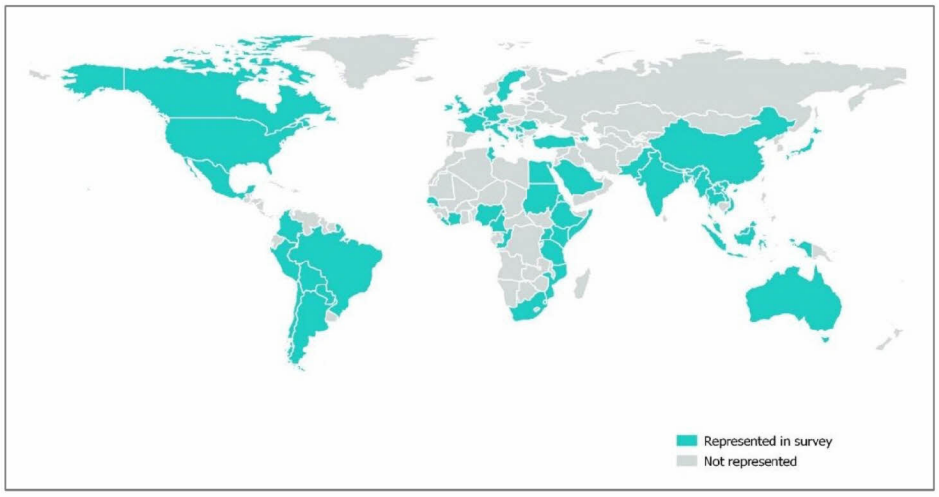
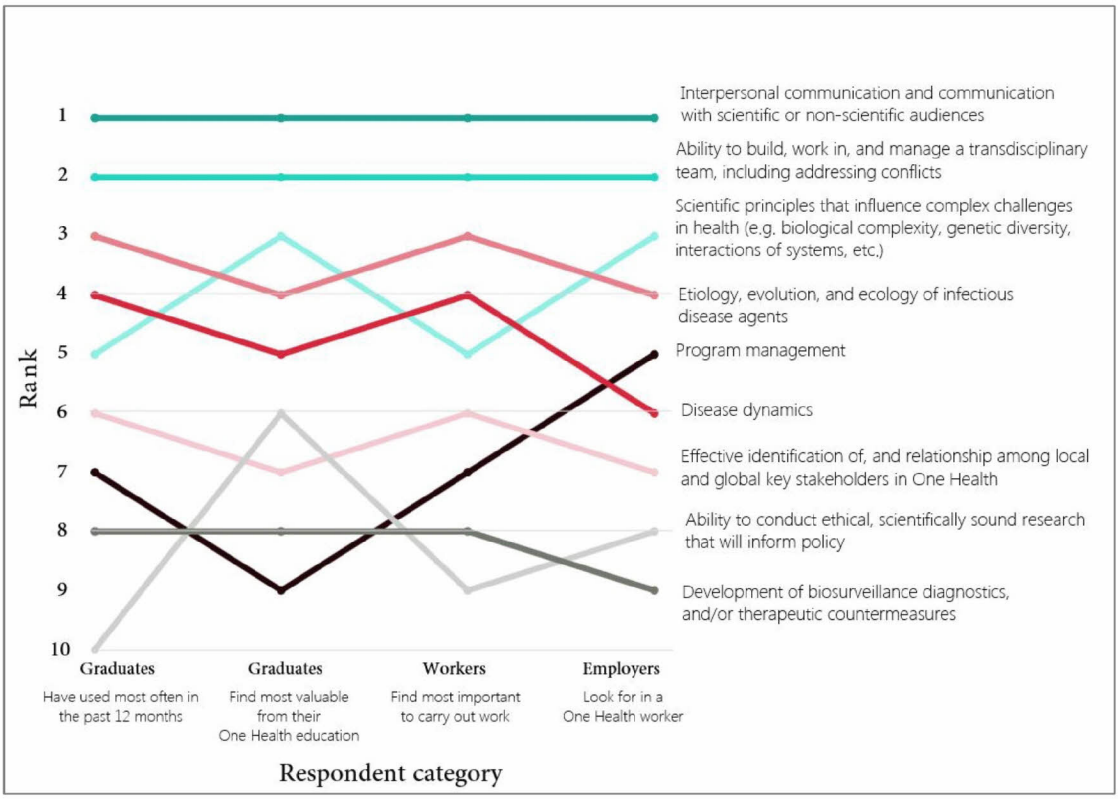


Figure 3. Ranking of important competencies as defined by graduates, workers, and employers



Other competencies that were perceived as important were:

- Disease dynamics
- Effective identification of, and relationship among, local and global key stakeholders in One Health
- Ability to conduct ethical, scientifically sound research that will inform policy
- Development of biosurveillance diagnostics, and/or therapeutic countermeasures

Table 2. Recommendations for students and early-career professionals, workers, and employers in One Health

Students and early-career professionals	Workers	Employers
☐ Speak with, and learn from professionals and mentors already working in your field of interest in One Health, because there are many ways to work in One Health; ☐ Evaluate how you would like to engage in One Health, and what expertise you would like to bring to an interdisciplinary or multisectoral team; ☐ When seeking a job, understand that the One Health approach is essential to most jobs within the relevant sectors, even if an opportunity is not explicitly advertised as "One Health". If possible, design work with a One Health scope and apply skills to add needed value and perspective; ☐ Build program leadership and management skills through practical experiences and coursework; ☐ Recognize that local and regional applications of One Health are as important as international ones; ☐ Become involved in professional societies to build professional relationships, hone your skills, and become more involved in your field of interest.	☐ Make sure all team members understand roles and responsibilities of members from other disciplines and sectors; ☐ Be proactive in taking on new assignments and opportunities to use your One Health competencies; ☐ Seek opportunities to work across disciplines and organizations, and demonstrate your collaborative, team building skills; ☐ Avoid the use of jargon or technical terms when communicating in an interdisciplinary or multisectoral team; ☐ Make an effort to understand your team members' expertise, skillset, and baseline knowledge of subject matter; ☐ Assign roles and responsibilities early on in the project, as is important in any professional situation; ☐ Describe in detail to employers how a One Health approach can enhance the organization's goals; ☐ Use consistent language around the meaning of One Health to increase awareness and understanding; ☐ Present and publish on your work at meetings, events, etc. outside of your discipline and sector to expand One Health networks and partnerships.	☐ Hire candidates with an interdisciplinary and collaborative approach, even for positions which do not include "One Health" in the position title; ☐ Explicitly use the term "One Health" and associated skills and competencies in job descriptions to help applicants identify positions as appropriate for their submission; ☐ Publicly share career trajectories and experiences of professionals working in your institutions; ☐ Ask current employees and candidates how One Health concepts can be integrated into your organization; ☐ Encourage workers to grow on the job, expand their value through continuing education and learning opportunities in One Health; ☐ Host students/interns or mentor students to help increase experience in One Health areas and promote One Health through student channels.

Table 1. Characteristics of students, graduates, workers, and employers who participated in the survey (n=828)

	Student (column %)	Graduate (column %)	Worker (column %)	Employer (column %)	Total (column %)
Count (n)	**173**	**345**	**612**	**226**	**828**
Gender					
Female	108 (62)	206 (60)	355 (58)	111 (49)	469 (57)
Male	63 (36)	134 (39)	251 (41)	111 (49)	321 (39)
Non-binary/third gender	0 (0)	1(<1)	1 (<1)	1 (<1)	2 (<1)
Prefer not to answer	2 (1)	3 (1)	4 (1)	2 (1)	5 (<1)
No response	0 (0)	1 (<1)	1 (<1)	1 (<1)	31 (4)
Age group (years)					
18-29	102 (59)	73 (21)	87 (14)	16 (7)	175 (21)
30-39	42 (24)	101 (29)	167 (27)	51 (23)	199 (24)
40-49	23 (13)	76 (22)	141 (23)	57 (25)	175 (21)
50-59	6 (3)	50 (14)	111 (18)	58 (26)	129 (16)
60-69	0 (0)	35 (10)	85 (14)	38 (17)	95 (12)
70-79	0 (0)	6 (2)	16 (3)	4 (2)	19 (2)
80+	0 (0)	1 (<1)	2 (<1)	0 (0)	2 (<1)
Prefer not to answer	0 (0)	3 (1)	3 (1)	2 (1)	4 (<1)
No response	0 (0)	0 (0)	0 (0)	0 (0)	30 (4)
Degree completed					
Bachelor's degree of 4 years or less	82 (47)	175 (51)	309 (50)	104 (46)	391 (47)
Master's degree (include MPH, MPVM etc.)	76 (44)	194 (56)	331 (54)	114 (50)	407 (49)
Professional degree in medicine, veterinary medicine, dentistry, or pharmacology	71 (41)	226 (66)	366 (60)	139 (62)	461 (56)
Research based doctoral degree [Doctor of Philosophy (PhD) or	30 (17)	127 (37)	246 (40)	112 (50)	287 (35)

Doctor of Public Health (DrPH)]					
Other professional degrees	8 (5)	26 (8)	55 (9)	20 (9)	64 (8)
SDG Regions					
Northern America	82 (47)	210 (61)	393 (64)	145 (64)	498 (60)
Latin America and the Caribbean	10 (6)	21 (6)	31 (5)	9 (4)	38 (5)
Europe	16 (9)	21 (6)	49 (8)	25 (11)	63 (8)
Northern Africa and Western Asia	6 (3)	3 (1)	4 (1)	2 (1)	10 (1)
Eastern and South-Eastern Asia	7 (4)	14 (4)	38 (6)	11 (5)	48 (6)
Sub-Saharan Africa	33 (19)	42 (12)	59 (10)	20 (9)	90 (11)
Central and Southern Asia	11 (6)	16 (5)	12 (2)	5 (2)	24 (3)
Oceania	2 (1)	6 (2)	6 (1)	1 (<1)	8 (1)
NA	6 (3)	12 (4)	20 (3)	8 (4)	49 (6)

From: David J Wolking <djwolking@ucdavis.edu>
Sent: Thu, 3 Sep 2020 11:58:03 -0700
Subject: Re: GVP & Predict twitter accounts both suspended right now.
To: Peter Daszak <daszak@ecohealthalliance.org>
Cc: David Wolking <djwolking@ucdavis.edu>, "Jonna Mazet (jkmazet@ucdavis.edu)" <jkmazet@ucdavis.edu>, "Johnson Christine Kreuder (ckjohnson@ucdavis.edu)" <ckjohnson@ucdavis.edu>, Robert Kessler <kessler@ecohealthalliance.org>

Hey Peter,
Eunah and I responded in the other thread, it's a work in progress but we hope it's resolved very soon.

David

On Wed, Sep 2, 2020 at 8:31 PM Peter Daszak <daszak@ecohealthalliance.org> wrote:

> I'm assuming you know about this but right now both @Globalvirome and @Predictproject are suspended by Twitter. Can Robert Kessler help work with you and Twitter to get them both back up and functioning? If this is some funding issue or some liability issue with UCD, we can host them or put them onto a single person's name.
>
> It's getting traction with the conspiracy people out there who, surprise surprise, believe this is something to do with us releasing pandemic viruses. It would be really good to get them back up so we don't create a story out of nothing.
>
> Cheers,
>
> Peter
>
> **Peter Daszak**
>
> *President*
>
> EcoHealth Alliance

520 Eighth Avenue, Suite 1200

New York, NY 10018-6507

USA

Tel.: +1-212-380-4474

Website: www.ecohealthalliance.org

Twitter: @PeterDaszak

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--

David J. Wolking
Senior Manager, Global Programs, One Health Institute
Global Operations Officer, PREDICT Project of USAID Emerging Threats Division
Senior Manager, PREEMPT Project
School of Veterinary Medicine
University of California, Davis

From: [redacted]
To: Dennis Carroll [redacted] Jonna Mazet <jkmazet@ucdavis.edu>
Cc: Peter Daszak <daszak@ecohealthalliance.org>
Subject: EBP and GVP partnership
Sent: Thu, 24 Sep 2020 15:59:29 +0000
The Earth BioGenome Project_Statement of Intent_GVP.docx
EBP MOU_Final_Signed_15_June_2020.pdf

Hi Dennis,

Please find attached the Earth Biogenome Project MOU for your review signature. As stated in the MOU, this does not form a legally binding agreement and is a collaboration. They also require a letter of intent. I have drafted my response and kept it relatively generic but could use your input on content in particular for the GVP capabilities section.

Please contact me if you have any questions. Ideally we need a very quick turnaround as EBP we have already missed their deadline.

Cheers,

[redacted]

The Earth BioGenome Project: Statement of Intent from New Members

The Earth BioGenome Project (EBP) comprises an inclusive global community of institutions and scientists who are committed to the goals and principles outlined in the Earth BioGenome Project Memorandum of Understanding (MOU).

For new member institutions, the EBP Working Group (or a successor committee of EBP governance) requires that a Statement of Intent be submitted with the executed MOU.

Please answer the following questions:

1. How do you envision your institution's participation in the Earth BioGenome Project?

The Global Virome Project (GVP) will join The Earth BioGenome Project (EBP) and the International Barcode of Life (IBoL) to form a new initiative to build a planetary genomic network that will serve as a future Pandemic Interception System. Establishing a global, genomic-based biosurveillance platform will be of immense value to biosecurity, biodefense, and the economy. The collaboration of EBP, IBoL, and GVP, in constructing an effective, innovative, and cost-effective approach to comparative genomics across all of Life, will immensely accelerate the discovery of species, their interactions, and the diversity of infectious agents involved in host-pathogen interfaces across the planet. This initiative will develop a surveillance system that facilitates preemptive strikes and rapid responses to potential pandemic outbreaks as well as early development of diagnostic pipelines and vaccines. Pathogens that have resulted in lethal epidemics within other non-human species of animals and plants will also be integrated into the program. The individual successes of EBP, IBoL, and GVP will ensure that a combined approach will rapidly achieve the establishment of a Pandemic Interception System that will serve all of humanity and Nature.

The collaboration will be mutually beneficial in raising the profile of both organizations and in the pursute of funding for both our joint and individual missions. By participtating in the EBP, the relationship will form a mode in which resources, such as animal samples, can be shared between the organizations, reducing operational efforts and costs for the genetic barcoding and virus discovery.

2. Describe your institution's capabilities for participation in EBP. Please address capacity for the following: Providing high quality tissue or DNA samples for DNA sequencing, High throughput DNA sequencing, Computing resources, Genome assembly, Genome annotation, Analysis and data visualization tools, Funding, Other

GVP has established protocols for the safe collection, processing and storage of high quality DNA samples for DNA sequencing. GVP has a network of relationships with instutions around the world who have been trained using the standardized protocols that can be leveraged for future collaborations and provision of samples. Through its partnerships with academic and non-profit organizations, including The University of California Davis, EcoHealth Alliance and the Trinity Challenge, GVP has experience within and access to capabilities for high throughput DNA sequencing, and computing power for genome assembly, annotation and analysis.

GVP is a registered 501(c)3 and is funded through in kind donations of time and resources. GVP is commited to fundraising it's activities and those in relation to joint pursutes between GVP and EBP.

3. What large-scale eukaryote genomics projects is your institution currently involved in and how are they funded?

GVP has access a large resource of wildlife samples and associated metadata collected around the world during the USAID PREDICT Project over the last 11 years. A selection of these samples have been barcoded for species identification, frequently revealing field misidentification and the discovery of new species. Through it's leadership board home institutions, GVP also brings connections to other iniativites in which collaborations can be formed for the expansion of eukaryotic genomics of wildlife and livestock, in particular relation to the pandemic interception system.

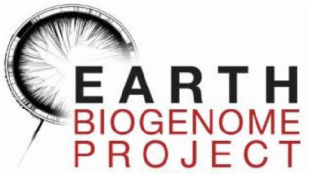
3. Please provide the names, position titles, and email addresses of lead faculty and professional staff that will be working on EBP-related projects, and identify the project they are working on.

The following personel will be involved in developing the Pandemic Interception System initiative:

Dr. Dennis Carrol, Board Chair, Global Virome Project, REDACTED

Dr. Jonna Mazet, Board Member & Implementation Director, Global Virome Project, jkmazet@ucdavis.edu

REDACTED, Project Manager, Global Virome Project, zlgrange@ucdavis.edu



MEMORANDUM OF UNDERSTANDING

among the Parties of the

EARTH BIOGENOME PROJECT

This Memorandum of Understanding ("MOU") is entered into by and among the Parties set forth in Appendix 1 to this MOU ("Original Parties"), as of the Effective Date specified hereafter. In addition, it is the expectation of those participating in the Earth BioGenome Project ("EBP") that additional Parties from around the world will join the collaboration over time in order to participate in and contribute to the initiative ("Additional Parties") using the process described below. The Additional Parties to the MOU are set forth in Appendix 2 to this MOU. Each of the Original Parties set forth in Appendix 1 to this MOU and each Additional Party that joins the collaboration identified in Appendix 2 to the MOU will be referred to collectively herein as the "Parties".

1. PURPOSE

The purpose of this MOU is to provide a framework for participation in the Earth BioGenome Project through the collaboration of the Original Parties set forth in the Appendix 1 to this MOU, as well as Additional Parties identified in Appendix 2 to the MOU, who will join the collaboration over time. This MOU does not create any legally binding obligation on the part of the Parties but the Parties may contemplate entering into legally binding agreements in the future to further their collaboration. The general intent of this MOU is to establish collaboration plans for the Parties. As Additional Parties join the initiative they will be added to the MOU in accordance with the terms set forth below. The Parties seek to complement each other's respective strengths, experience, and technologies in order to facilitate increased collaboration in environmental, biodiversity, and genomic sciences to further the goals of the Earth BioGenome Project.

2. BACKGROUND

Understanding, conserving and responsible stewardship of Earth's biodiversity are among the most challenging scientific and social challenges of the new millennium. Addressing these challenges requires fundamental new knowledge to fill the huge gaps in our understanding of the organization, evolution, functions, and interactions among organisms. This knowledge can be gained in part by sequencing and characterizing the genomes of all known eukaryotic species on Earth in a rapid and standardized fashion. To promote a global effort in biodiversity genomics, a number of institutions have organized to form an unincorporated international collaboration called the Earth BioGenome Project (EBP).

The Parties of EBP recognize that the scope of the initiative exceeds the capability of any one Party to undertake; each Party recognizes that participating in and contributing to the shared development of EBP standards and activities advances its individual interests and that of society at large. As such, the Parties believe that by entering into this MOU they will be able to develop the EBP and further their respective missions in a manner in which they would not be able to do individually.

Accordingly, the Parties have agreed that a coordinated, international, scientific effort is needed, and they hereby express their intent to become Parties of the EBP, and in doing so identify their roles and functions associated with maintaining and expanding EBP.

EBP also acknowledges that the Convention on Biological Diversity has noted "the general lack of information and knowledge regarding biological diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures." To the greatest extent possible, EBP agrees to adhere to the principles that regulate the accessibility of biological materials, including the Convention on Biological Diversity (CBD, 1993), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1975), the International Plant Protection Convention (IPPC, 1952), the International Treaty on Plant Genetic Resources for Food and Agriculture (IT PGRFA, 2004), the Convention on the Conservation of Migratory Species of Wild Animals (CMS, 1983), and the International Whaling Commission (IWC, 1946).

To the greatest extent possible, EBP will conduct its activities in alignment with the objectives and principles of the the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2014). The Parties acknowledge that the EBP will have an instrumental role in unleashing valuable inclusive bioeconomy innovations for biodiverse nations that can provide an alternative path for economic development that is sustainable by design.

To the greatest extent possible, EBP will promote the principles of open accessibility to biogenomic information with the understanding that the Original Parties will address the issues of permissible use and benefit sharing as a global consensus develops.

Membership in EBP will not affect the normal operations of the Parties.

3. COLLABORATIVE OBJECTIVES

This MOU formalizes the intent of the Parties to develop a global "network of communities" as the most realistic strategy for achieving the grand challenge goal of sequencing all life on Earth. This MOU further sets forth the general intentions of the Parties to engage in these scholarly activities that are strictly non-profit seeking, in a manner that will not create a commercial advantage to any of the Parties. The Parties of EBP agree to conduct collaborative activities dedicated to achieving the following goals directly or indirectly:

- *Revise and reinvigorate our understanding of biology, ecosystems and evolution*
    - To better understand evolutionary relationships among all known organisms
    - To fully elucidate the distribution and density of species on Earth
    - To generate new knowledge of ecosystem composition and functions
    - To discover new species
    - To elucidate genome evolution
    - To discover fundamental laws that describe and drive evolutionary processes
- *Enable the conservation, protection, and regeneration of biodiversity*
    - To determine the role of climate change in sustaining biodiversity
    - To clarify how human activities and invasive species affect biodiversity
    - To develop evidence-based conservation plans for rare and endangered species

- To create genomic resources to restore damaged or depleted ecosystems
- *Maximize returns to society and human welfare*
  - Through vast new medicinal resources for human health
  - Through enhanced prediction and control of pandemics
  - Through new genetic variation for improving agriculture
  - Through novel materials and resources for bio-based industries
  - Through improvements in environmental quality and ecosystem services

4. SCOPE OF THE COLLBABORATION

Parties in the EBP share an interest in generating complete genomes for biodiversity of non-human life on Earth. Through the EBP, the Parties resolve to explore ways in which they could work together to develop and increase the capacity for understanding and utilizing biodiversity from across the planet. Such collaboration will be agreed to in future written agreements, but may include the following:

- Cataloging the genome content of all Earth's biodiversity;
- Establishing mechanisms of data sharing that will build a permanent, freely-accessible resource for future scientific discovery in alignment with applicable national and international regulations and protocols to the extent possible; and
- Driving solutions for preserving Earth's biodiversity, managing its ecosystems, spawning bio-based industries, and sustaining human societies.

In order to achieve these outcomes, the Parties of the EBP recognize the need for collaboration agreed to in future written agreements to:

- Encourage active collaboration and communication;
- Ensure consistent quality standards for genomic sequencing, annotation, and analyses;
- Improve best practices for the preservation and use of genomic sample and collections.

5. IMPLEMENTATION OF SPECIFIC PROJECTS

The Parties will enter into a separate written agreement for each specific initiative or project arising under this MOU that requires the commitment of funds and other resources from two or more Parties or otherwise necessitates written documents reflecting the Parties' mutual understanding of details related to the planning, development and implementation of the project

("Project Agreements"). Project Agreements involving the exchange of specimens, data or information will include provisions governing intellectual property rights and, if necessary, export control regulations.

6. FUNDING

This MOU creates no financial obligation or commitment of staff or other resources on the part of any Party. All activities undertaken pursuant to this MOU shall be subject to available funding and availability of in-kind resources. In general, each Party will be responsible to raise its own funds to execute the research program proposed in this MOU. In case funding opportunities or exchange funding are made available, it is understood that the applicable Parties will negotiate and sign further Project Agreements between themselves to execute the research activities described in *Scope of the Collaboration*.

7. AUTHORIZED REPRESENTATIVES

Authorized Representatives of the Original Parties are as shown in Appendix 1, and Authorized Representative of the Additional Parties are shown in Appendix 2 to this MOU.

8. DURATION, TERMINATION AND AMENDMENT

Duration. This MOU shall remain in force for five (5) years from the date it has been signed by at least four Original Parties ("Effective Date"). Any Party may terminate it's own involvement in this MOU by providing 60 days' advance written notice to the other Parties. Separate agreements entered into governing funded projets will identify appropriate mechanisms and timelines for the projects to reach an orderly conclusion in accordance with the relevant Project Agreement.

Extension and Renewal. The Parties may extend or renew this MOU by mutual agreement of a majority of the Original Parties, confirmed in a written amendment signed by each Party's authorized signatory.

Amendment. No amendment of the terms of this MOU will be effective unless made in writing and signed by a majority of the Original Party's authorized signatory followed by required notice of the amendments to all Parties.

Additional Parties. Additional Parties may join the collaboration over time in order to

participate in and contribute to the initiative. Additional Parties will be reflected in Appendix 2 to the MOU. They will be bound by all of the terms of the MOU. All Original Parties will be provided written notice that an Additional Party would like to join the MOU. Each Original Party will have fourteen (14) days to raise an objection in writing to the inclusion of a proposed Additional Party to the MOU. If no Original Party objects in writing to the inclusion of the proposed Additional Party within this timeframe, the Additional Party will become a Party to the MOU. If an objections is raised by an Original Party within the fourteen (14) day timeframe, the Additional Party will not join the MOU.

Entire Agreement. The terms and conditions herein constitute the entire agreement and understanding by and between the Parties and shall supersede all other communications, negotiations, arrangements, and agreements either oral or written, with respect to the subject matter herein.

9. GENERAL MATTERS

Use of Names. Each Party may use the other Party's name and/or mark in announcing and otherwise promoting this MOU or a specific Project Agreement, provided all language and phrases concerning or referring to the other Party shall be approved in writing in advance by the other Party. Except as permitted under this paragraph, Parties may only use the name, logo or trademarks of other Parties in any form, whether written, oral or visual for any purpose whatsoever, with express written permission. Nothing in this MOU shall be deemed confidential.

Nondiscrimination. In the administration of this MOU or any Project Agreements, the Parties shall not discriminate on any basis prohibited by applicable law, including on the basis of race, sex, age, disability, ethnicity, religion, or national origin.

Notices. The Parties must give all notices under this MOU in writing. All communications must be sent to the addresses set forth below or to such other address designated by the Parties by written notice. Notices are effective upon receipt.

Dispute Resolution. The Parties agree to make efforts in good faith to resolve all disputes amicably and expeditiously between themselves by good faith consultation or negotiation by the Institutional Representatives or their designees, or by any other way agreed upon by the Parties.

Non-Binding Nature. This MOU is not intended to and does not give any person who is not a

Party to it any rights to enforce any of its provisions. Nothing in this MOU will be construed as creating binding legal obligations between the Parties. This MOU is a broad statement of intent which sets forth the general basis upon which the Parties wish to proceed. No legal liability will arise in respect of any subject matter hereof unless a subsequent binding agreement is negotiated, approved, executed and delivered by the Parties to this MOU. Under no circumstances will this MOU be construed as creating or establishing any formal, legal, association, partnership, joint venture, principal/agent or master/servant relationship between the Parties.

Force Majeure. The Parties acknowledge that any project arising under this MOU may be suspended or terminated due to an event of force majeure including, but not limited to, fire, earthquake, epidemic, explosion, casualty, strike, act of war, riot, civil disturbance, terrorism, act of God, state, local or national law, decrees or ordinance, or any executive or judicial order, or any other reason beyond the Parties' control. Each Party will notify the other Party as soon as it is aware of any event of force majeure which would delay or prevent the performance. In the event of a force majeure, the Parties will consult with each other to determine a revised timeline for performance or whether to terminate the MOU.

Authorized Signatories. Each Party represents that the individuals signing this MOU have the authority to sign on its behalf in the capacity indicated.

10. COUNTERPARTS

This MOU may be executed in any number of counterparts, each of which shall be an original as against the party whose signature appears thereon, but all of which taken together shall constitute but one and the same instrument.

Appendix 1:

Original Parties to Memorandum of Understanding on the Earth BioGeome Project

(2) Party name: The Regents of the University of California on behalf of its Davis Campus, USA

Signed: _____

Name: Cindy M. Kiel

Title: Executive Associate Vice Chancellor

On behalf of: Office of Research

(3) Party name: Carl R. Woese Institute of Genomic Biology, University of Illinois at Urbana-Champaign, USA

The Board of Trustees of the University of Illinois

Signed: _____

Name: Avijit Ghosh

Title: Comptroller

On behalf of: Gene Robinson

Comptroller Delegate:
Julie Robinson, Assistant Director

(4) Party name: The Board of Trustees of The Royal Botanic Gardens at Kew, UK

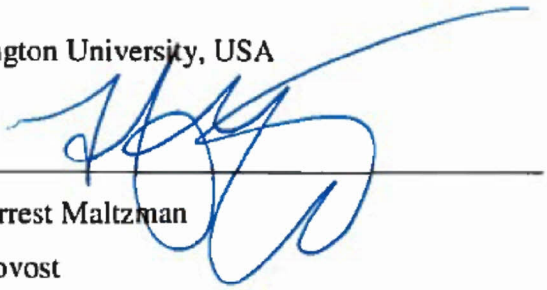
Signed: _____

Name: Professor Kathy Willis

Title: Director of Science

On behalf of: Royal Botanic Gardens, Kew

(5) Party name: George Washington University, USA

Signed: 

Name: Forrest Maltzman

Title: Provost

On behalf of: The George Washington University

(6) Party name: Wellcome Sanger Institute, UK

Signed: 

Name: PROF. SIR MIKE STRATTON

Title: DIRECTOR + CHIEF EXECUTIVE

On behalf of: WELLCOME SANGER INSTITUTE 24. JULY. 2018

(8) Party name: Natural History Museum of Denmark

Signed: 

Name: M Thomas P Gilbert

Title: Professor of Palaeogenomics

On behalf of: Natural History Museum of Denmark

(11) Party name: The Regents of the University of California on behalf of its Santa Cruz Campus, USA

Signed: Deirdre Beach Digitally signed by Deirdre Beach DN: cn=Deirdre Beach, o=UC Santa Cruz, ou=Office of Sponsored Projects, email=dbeach@ucsc.edu, c=US Date: 2018.10.11 11:45:38 -07'00'

Name: Deirdre Beach

Title: Asst. Director, OSP

On behalf of: The Regents of the University of California, Santa Cruz

(13) Party name: Baylor College of Medicine, USA

Signed:

Name: Richard A. Gibbs, Ph.D.

Title: Director, Human Genome Sequencing Center

On behalf of: _____

(14) Party name: Fundação De Amparo À Pesquisa Do Estado De São Paulo (Fapesp), Brasil

Signed: _____

Name: Marco Antonio Zago

Title: Presidente

On behalf of: _____

(15) Party name: University of Florida, USA

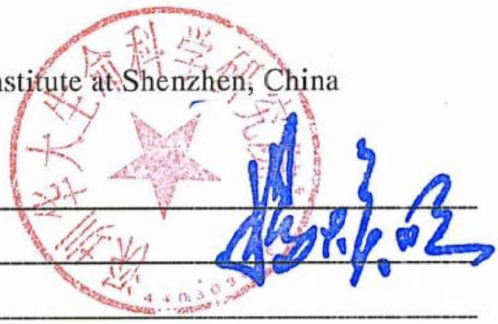
Signed: _____ DN: cn=Kaden B. Canfield, o=University of Florida, ou=Office of Research, email=kcanfield@ufl.edu, c=US Date: 2018.08.14 17:10:49 -04'00'

Name: Kaden B. Canfield

Title: Asst. Director of Research

On behalf of: Vice President for Research, University of Florida

(16) Party name: Beijing Genomics Institute at Shenzhen, China



Signed: _____

Name: _____

Title: _____

On behalf of: _____

(17) Party name: Max-Planck Institute of Molecular Cell Biology and Genetics, Germany

Signed: _____

Name: Eugene W. Myers Jr.

Title: Managing Director

On behalf of: _____

(18) Party name: SpaceTime Ventures, Brasil

Signed: _____

Name: JUAN CARLOS CASTILLA-RUBIO

Title: CHAIRMAN

On behalf of: SPACETIME VENTURES

Appendix 2:

Additional Parties to Memorandum of Understanding on the Earth BioGeome Project

(1) Party name:

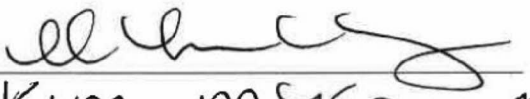
Signed: 

Name: Aristides A.N. Patrinos Ph.D.

Title: Chief Scientist

On behalf of: THE NOVIM GROUP

(1) Party name:

Signed: 

Name: Kim McKay AO

Title: Director + CEO

On behalf of: Australian Museum

(1) Party name:

Signed: 

Name: DUNCAN IVISON

Title: DVC RESEARCH

On behalf of: THE UNIVERSITY OF SYDNEY

(1) Party name:

Signed:

Name: Prof. Flavio Slazar D.

Title: Vice Rector for Research, University of Chile

On behalf of: Dr. Miguel L Allende, Director, The Center for Genome Regulation

(1) Party name:

Signed:

Name: Anna Fitzgerald

Title: Strategic Partnerships

On behalf of: Bioplatforms Australia

(1) Party name:

Signed:

Name: NEIL HALL

Title: DIRECTOR

On behalf of: THE EARLHAM INSTITUTE.

LEGAL APPROVED

(1) Party name: Dalhousie University

Signed:

Name: Dr. Alice Aiken

Title: Vice President Research & Innovation

On behalf of: Dalhousie University

(1) Party name: King Abdulaziz University, Jeddah, Saudi Arabia

Signed: _____

Name: Prof. Dr. Abdulrahman Obaid Alyoubi

Title: President of King Abdulaziz University

On behalf of: King Abdulaziz University

(2) Party name:

(1) Party name:

Signed: _____

Name: François Bénard, MD

Title: Vice President, Research
BC Cancer Agency

On behalf of: _____

(1) Party name: Korea Polar Research Institute, Republic of Korea

Signed: _____ December 17, 2018

Name: Dr. Ho Il Yoon

Title: President

On behalf of: Korea Polar Research Institute

(1) Party name: UNIVERSITAT POMPEU FABRA

Signed: _____

Name: Enric Vallduví

Title: Vice-rector for Projects in Research

On behalf of: UNIVERSITAT POMPEU FABRA

(1) Party name:

Signed: 

Name: Svein Stølen

Title: Rector

On behalf of: University of Oslo

(1) Party name: Korea University, Republic of Korea

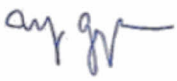
Signed: 

Name: _Hyun Park

Title: _Professor

On behalf of: ___Korea University ___

(1) Party name: Science for Life Laboratory, Genomics Platform, Sweden

Signed: 

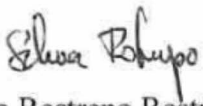
Name: Ulf Gyllensten

Title: Professor, Director

On behalf of: Science for Life Laboratory (SciLifeLab), Genomics Platform

(1) Party name: Universidad de los Andes, Bogotá – Colombia

Signed:



Name: Silvia Restrepo Restrepo

Title: Vice President for research

On behalf of: _____

(1) Party name: THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE

Signed: 

Name:

Title:

On behalf of: Dr Jo Dekkers
~~Head of Research Operations~~
The University of Cambridge

(1) Party name: Universidad Nacional Autónoma de México (UNAM)

Signed:

Name: PhD Jorge Vázquez Ramos

Title: Coordinator for liaison and Technology transfer

On behalf of: ENES-Leon, lab of evolutive and population genomics (PhD Hernandez-Lopez)
Biology Institute, Evolutive Biology (PhD Zaldívar Riverón)

(19) Party Name: Duke University

Signed: Keith Hurka-Owen

Name: Keith Hurka-Owen
Title: Executive Director
On behalf of: Anne Yoder

(1) Party name: LOEWE TBG - TRANSLATIONAL BIODIVERSITY GENOMICS

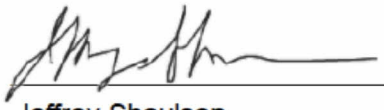
Signed:

Name: AXEL JANKE

Title: PROF. DR.

On behalf of: LOEWE-TBG

(1) Party name: University of Connecticut, Institute for Systems Genomics

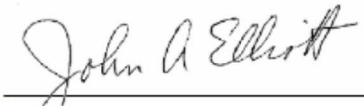
Signed: 

Name: Jeffrey Shoulson

Title: Vice Provost for Academic Operations

On behalf of:

(2) Party name:

Signed: 

Name: John Elliott

Title: Interim Provost and Executive Vice President for Academic Affairs

On behalf of:

- Compiled 15 June 2020