

# Partnering with regions and countries to identify priority pathogens for vaccines



## Immunization, Vaccines and Biologicals

Vaccine Prioritization & Platforms Team

PDVAC 5 December 2022

# Three components to this presentation



Why do we need to identify ‘priority pathogens’?



Progress to date



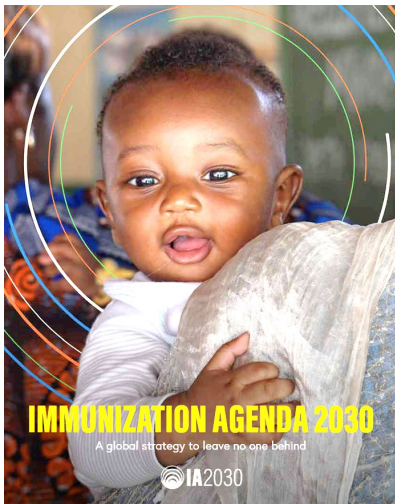
Discussion



# We need a 'better' prioritization strategy for new vaccines

In line with IA2030 principles and ways of working

Immunization Agenda 2030 – grounded in regional partnership



IA2030 Vision for SP7: Research & Innovation

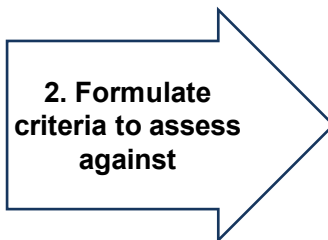
- Aligned priorities can focus funding and resources, and enable coordination for acceleration
- A robust priority-setting process will build awareness of disease burden, risks and threats, and potential interventions.
- We are seeking to **collectively** develop an approach to identify **regional and country priorities for vaccine R&D**, and a mechanism to drive progress at the country, regional and global levels
- The first deliverable is **“short list”** of *global pathogen targets for new vaccines—where vaccines do not yet exist, or where a new indication is needed*
- **Partnership model can be applied to other elements of the IA2030 agenda, such as implementation research**

# Collaborative approach to identify regional priorities

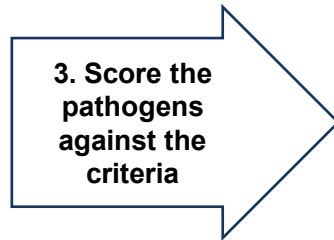
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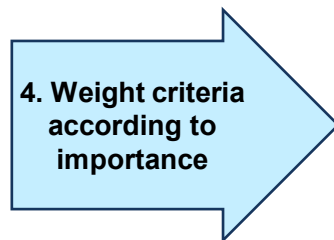
Proposed scope is 24 pathogens with vaccines in the pipeline



e.g. “annual deaths in the region”, “contribution to inequity”, etc.



Based on the best available regional data



Regional and country stakeholders complete a 30-minute “**Preferences Survey**”



Survey tool multiplies Score x Weight

## Regional consultations



Regional consultations\* consider the ranking and make their recommendations on priority pathogens



**PDVAC** aggregates regional priorities into a global “short list”  
**SAGE** reviews and endorses short list



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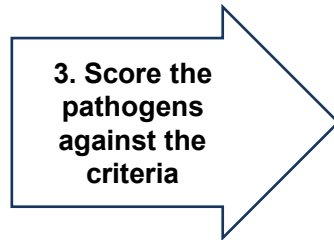
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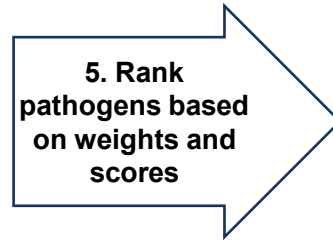
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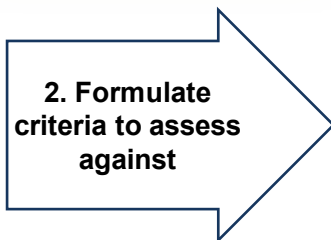
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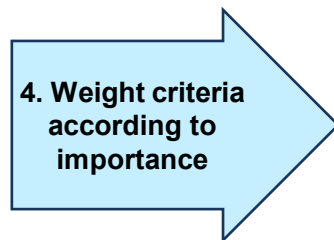
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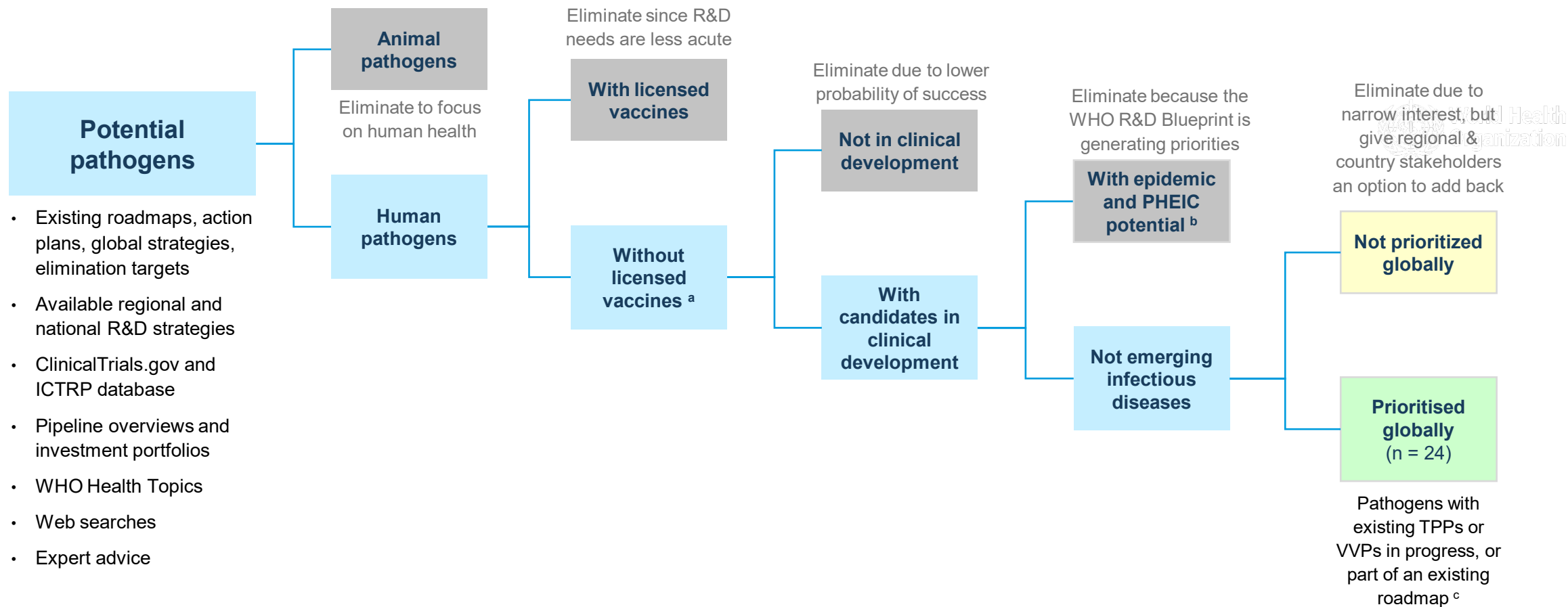


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# Pathogen scope

Starting with an open mind and making deliberate, transparent choices



<sup>a</sup> Pathogens where vaccines for new indications are needed were included. <sup>b</sup> PHEIC: Public health emergency of international concern. <https://www.who.int/teams/blueprint/updating-the-who-list-of-pathogens-with-epidemic-and-pheic-potential>

<sup>c</sup> Roadmaps include *Vaccines to tackle drug resistant infections*, and *Roadmap for NTDs* Abbreviations: ICTRP – International Clinical Trials Registry Platform. NTD – neglected tropical disease. TPP – target product profile. VVP – Vaccine Value proposition

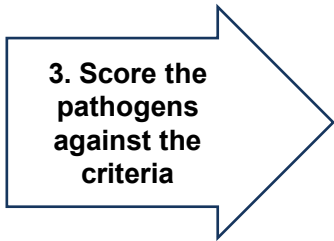
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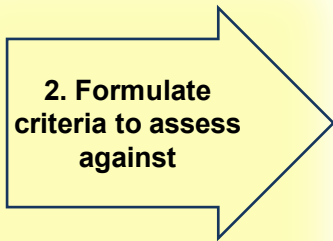
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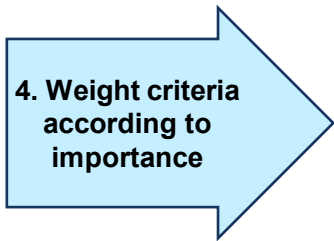
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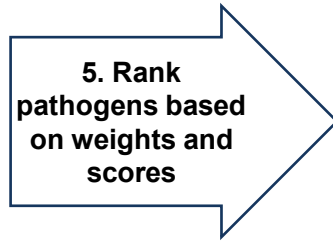
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# Criteria for prioritization

## Quantitative Scoring

Annual deaths in children under 5	Deaths attributable to the pathogen in both sexes, < 5 years old
Annual deaths in people 5 and older	Deaths attributable to the pathogen in both sexes, ≥ 5 years old
Years lived with disability (all ages)	Years of healthy life lost each year due to disability or ill-health caused by the pathogen

## Qualitative Scoring

Social and economic burden per case	Reflects individual social and economic impact such as stigma and the costs of prevention, health care, and lost productivity.
Disruption due to outbreaks	Reflects societal impact due to outbreaks and epidemics, including social disruption; impact on healthcare systems, trade or tourism; and the cost of containment measures
Contribution to inequity	Reflects disproportionate impact on socially and economically disadvantaged groups, including women
Contribution to antimicrobial resistance (AMR)	Reflects the threat of resistance, based on current levels of resistance, contribution to antibiotic use, and designation as an AMR priority
Unmet needs for prevention and treatment	Reflects the effectiveness and suitability of alternative measures



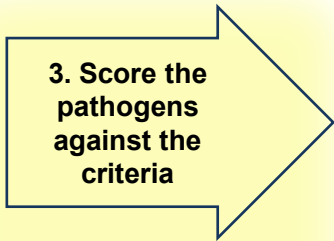
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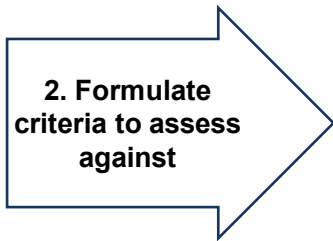
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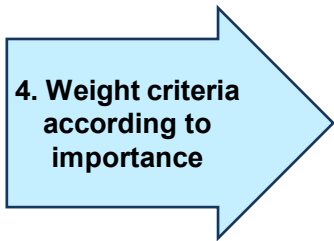
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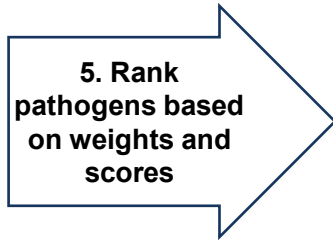
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## What is scoring?

- Each criterion has 5 levels:

Very low	Low	Medium	High	Very high
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- For each of the criteria, decide which pathogens belong in which level
- Should be
  - Regionally focused
  - Consistent and evidence-based
  - Practical
  - Transparent


## Quantitative criteria

1. **Data from GBD 2019** for each pathogen in each region
2. **Divide the range of values into 5 equal parts**  
(max burden)  $\div$  5 = step size  
Exclude HIV, TB, and malaria to enable more discrimination among lower-burden pathogens



## Qualitative criteria

1. **Support team proposes scores** using a scoring rubric
2. **Regional and disease experts review**  
At least 2 experts per region and at least one expert per disease
3. **Regional consultations finalize scores**



# Example Pathogen Datasheet

## Respiratory Syncytial Virus

### Indicative scores

Criteria	African	Americas	E. Med.	European	SE Asian	W. Pacific	Global
1 Annual deaths in children under 5	72,040 High (A)	4,077 Medium (A)	10,052 Low (A)	3,404 Very high (A)	27,492 High (A)	6,588 Very high (A)	123,790 High (A)
2 Annual deaths in people 5 and older	30,023 Low (A)	39,269 Low (A)	6,401 Very low (A)	36,190 Very low (A)	63,633 Low (A)	38,477 Very low (A)	214,704 Low (A)
3 Annual years lived with disability (all ages)	8,926 Very low (A)	5,354 Very low (A)	3,034 Very low (A)	4,249 Very low (A)	23,838 Very low (A)	4,922 Very low (A)	50,426 Very low (A)
4 Social and economic burden per case	Medium (B)	Medium (A)	Medium (A)	Medium (A)	Medium (A)	Medium (A)	Medium (A)
5 Disruption due to outbreaks	High (A)	High (A)	High (A)	High (A)	High (A)	High (A)	High (A)
6 Contribution to inequity	Medium (B)	Medium (A)	Medium (B)	Medium (B)	Medium (B)	Medium (B)	Medium (A)
7 Contribution to antimicrobial resistance	Medium (B)	Medium (A)	Medium (B)	Medium (A)	High (B)	High (A)	Medium (A)
8 Unmet needs for prevention & treatment	High (A)	High (A)	High (A)	High (A)	High (A)	High (A)	High (A)

Code	Quantitative: Criteria 1 - 3	Qualitative: Criteria 4 - 8
A	Burden data from GBD	Based on data from regional sources
B	Burden calculated by other studies	Scored based on sources from other regions or pathogens
C	Data not available	--



# Example Regional Datasheet

## AFR Social and economic burden per case



### Indicative scores

Region	Criterion	Data availability	Score				
			Very low	Low	Medium	High	Very high
African Region	4 Social and economic burden per case	A: Based on data from regional sources		Hookworm	Chikungunya virus Intestinal pathogenic <i>E. coli</i> (InPEC) Norovirus Schistosomes	Group A streptococcus Group B streptococcus Non-typhoidal <i>Salmonella</i> <i>Plasmodium falciparum</i> (malaria) <i>Shigella</i>	Herpes simplex types 1 and 2 HIV-1 <i>Mycobacterium leprae</i> (leprosy) <i>Mycobacterium tuberculosis</i> (TB)
		B: Score inferred based on sources from other regions	Influenza <i>Salmonella Paratyphi</i>	Extra-intestinal pathogenic <i>E. coli</i> (ExPEC) <i>Neisseria gonorrhoeae</i> Respiratory syncytial virus	Cytomegalovirus <i>Klebsiella pneumoniae</i> <i>Pseudomonas aeruginosa</i> <i>Staphylococcus aureus</i>	Leishmania	

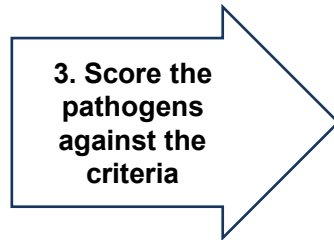
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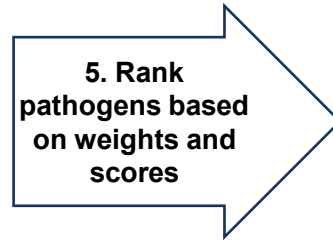
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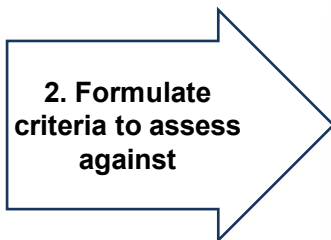
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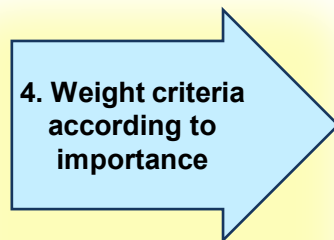
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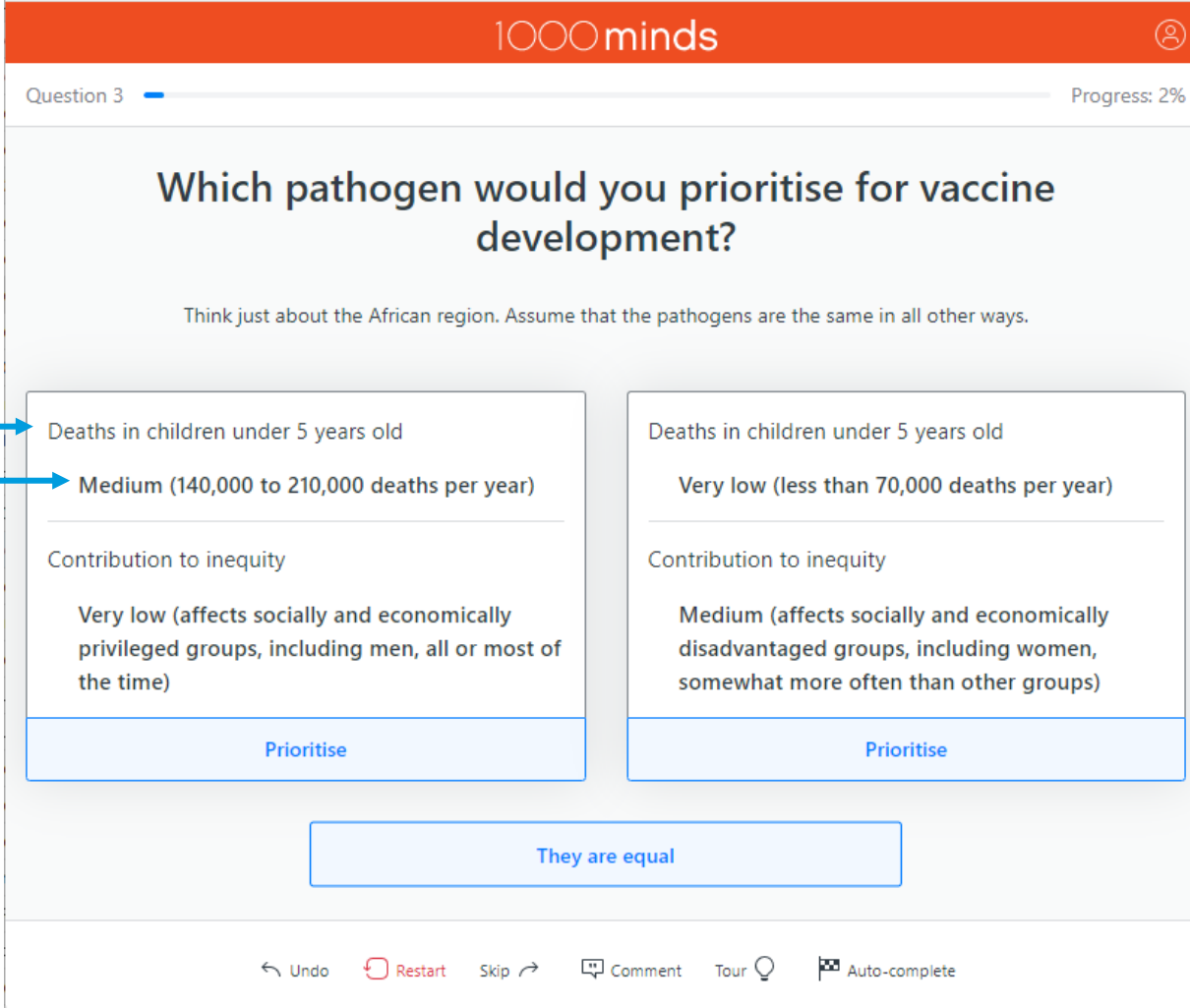


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# Preferences Survey

## Discrete choice approach



1000 minds

Question 3 Progress: 2%

### Which pathogen would you prioritise for vaccine development?

Think just about the African region. Assume that the pathogens are the same in all other ways.

**Criteria** → Deaths in children under 5 years old

**Level** → Medium (140,000 to 210,000 deaths per year)

Option 1	Option 2
Deaths in children under 5 years old	Deaths in children under 5 years old
Medium (140,000 to 210,000 deaths per year)	Very low (less than 70,000 deaths per year)
Contribution to inequity	Contribution to inequity
Very low (affects socially and economically privileged groups, including men, all or most of the time)	Medium (affects socially and economically disadvantaged groups, including women, somewhat more often than other groups)
Prioritise	Prioritise

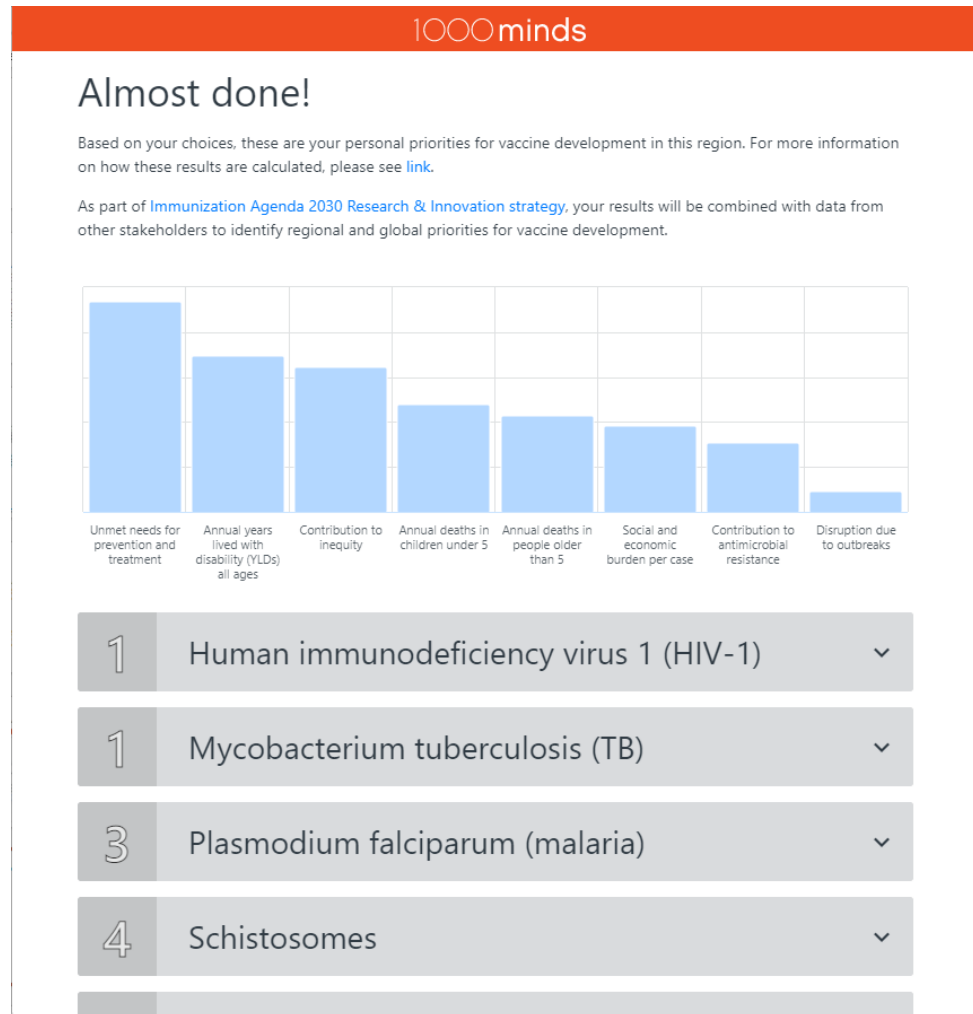
They are equal

Undo Restart Skip Comment Tour Auto-complete

- Multi-criteria approach is designed for decisions with multiple trade-offs and diverse stakeholder perspectives
- Choice is between two hypothetical pathogens, reducing bias
- Criteria are clearly explained so non-experts can use the survey
- Translated into multiple languages to enable broader participation



# Rank pathogens based on weights x scores

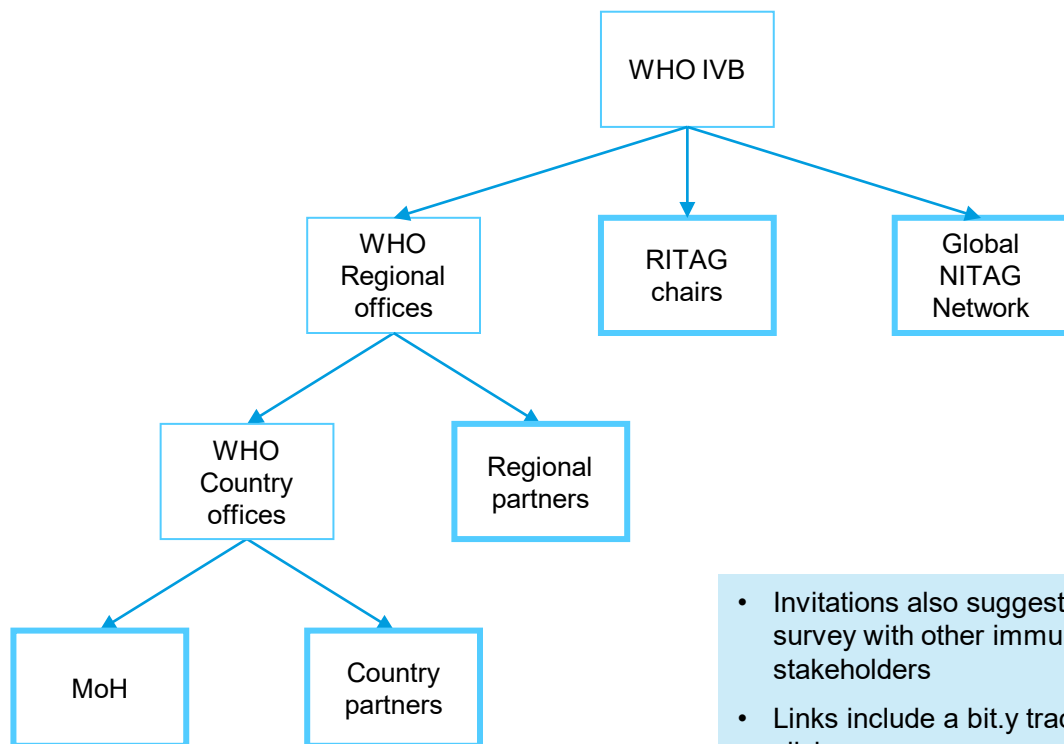


- At the end of each survey, users will see:
  - What criteria they value most
  - Their personal priorities
- Data analysis will summarize priorities for each region
- Can include additional pathogens and updated scores



# Survey Dissemination

## Regional Survey Dissemination



- Invitations also suggest sharing the survey with other immunization stakeholders
- Links include a bit.ly tracker to monitor clicks
- **Surveys stay open until Dec 16**

## Starting November 22, regional surveys sent to:

1. Country experts via WHO Regional Advisors for Immunization: Benido Impouma, Daniel Salas, Quamrul Hasan, Siddhartha Datta, Yoshihiro Takashima, Sunil Bahl
2. RITAG Chairs: Helen Rees, Peter Figueroa, Ziad Memish, Adam Finn, Gagandeep Kang, Chris Morgan
3. Global NITAG Network (via Louise Henaff)
4. AFRO Science and Technology Cluster (via Moredreck Chibi)
5. PAVM and African CDC (via Nicaise Ndembi)

## Global survey sent to:

1. WHO Immunization, Vaccines and Biologicals
2. IFPMA (via Paula Barbosa)
3. DCVMN (via Rajunder Suri)
4. PDVAC and SP7 WG Core representatives

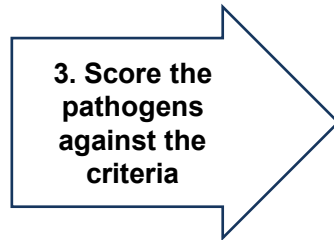


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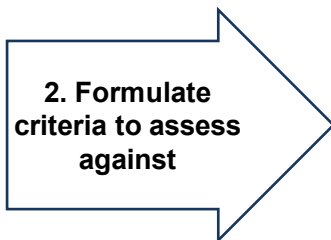
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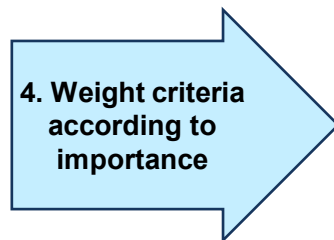
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# Survey Responses

as of 3 December

Region	Survey Languages	Clicks*	False Starts	Complete responses	Countries represented
African	English, French, Portuguese	133	11	14	12
Americas	English, Portuguese, Spanish	106	3	9	5
E. Med.	Arabic, English, French	201	22	23	10
Europe	English, French, Portuguese, Spanish, Russian	111	3	3	2
South-East Asian	English, Portuguese	106	18	10	5
W. Pacific	English, French (Chinese in preparation)	66	5	7	4
<b>Total (regions only)</b>		<b>723</b>	<b>62</b>	<b>66</b>	<b>38</b>
<i>Global</i>	<i>English</i>	<i>144</i>	<i>17</i>	<i>21</i>	<i>11</i>

## Observations

1. Many more clicks on survey links than complete responses
2. E. Med survey was announced at regional meeting, driving interest
3. Responses too few to make inferences

Note: No set target for number of responses, we will look at % of countries and % of population represented per region

\* Clicks as of 4 December



# Additional information

Can be used to understand stakeholder perspectives

## Respondent Information

1. **Name and email address** for tracking only, personal identifiers will not be shared
2. **Country of work**
3. **Type of organization**
4. **Area of expertise**
5. **Years of experience**

## Face Validity

1. **Perceptions:** Was the survey easy or difficult to understand?
2. **Criteria Weights:** Does the order of criteria in the bar chart seem correct to you?
3. **Ranking:** Does the order of pathogens listed seem reasonable to you?
4. **Open-ended:** In your results, what was surprising? What was as expected?



# Respondents

as of 3 December

## Self-descriptions

Organization	African	Americas	E. Med.	European	SE Asian	W. Pacific	Global	Total
Academic institution	6	5	7	1	3	4	2	28
Funding agency	0	0	0	0	0	1	1	2
Government	5	2	7	1	5	3	2	25
Healthcare provider	3	4	6	1	1	1	0	16
Non-governmental organisation	0	0	5	0	0	2	3	10
Pharmaceutical industry	0	0	1	1	0	0	10	12
Regulatory agency	0	0	1	0	0	0	0	1
UN Agency	1	1	4	0	1	1	3	11
OtherOrg	2	1	0	0	1	0	1	5

## Expertise

Disease epidemiology	8	4	12	1	3	4	6	38
Economics and health financing	0	1	3	0	0	0	2	6
Healthcare	5	6	13	0	4	3	2	33
Health policy	5	3	7	3	3	3	5	29
Regulatory affairs	0	0	1	0	1	0	2	4
Vaccine research and development	8	3	3	2	7	4	17	44
OtherExpertise	2	1	3	2	0	1	2	11

## Experience

Up to 10 years	0	2	1	0	3	0	2	8
11 - 20 years	6	2	9	0	1	0	7	25
21 - 30 years	3	2	6	2	2	1	6	22
More than 30 years	5	3	7	1	4	6	6	32

## Notes

- Will enable segmentation by organization type, expertise, and years of experience
- So far, few funders, economists, or regulators, many R&D

Note: Respondents could pick multiple organizations and areas of expertise



# Next step will be regional consultation to agree on priorities

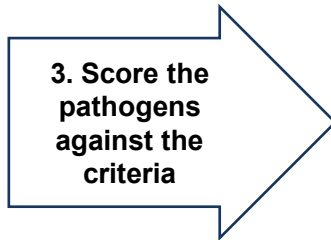


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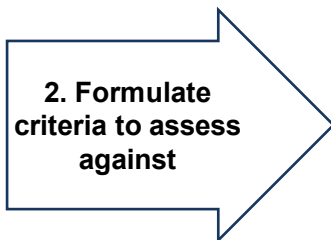
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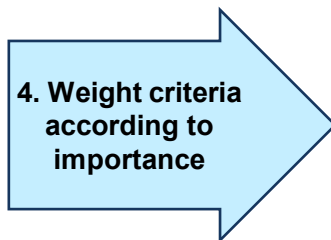
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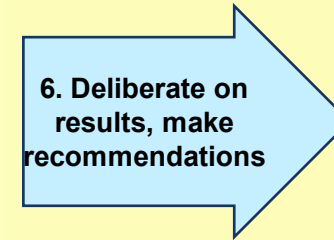
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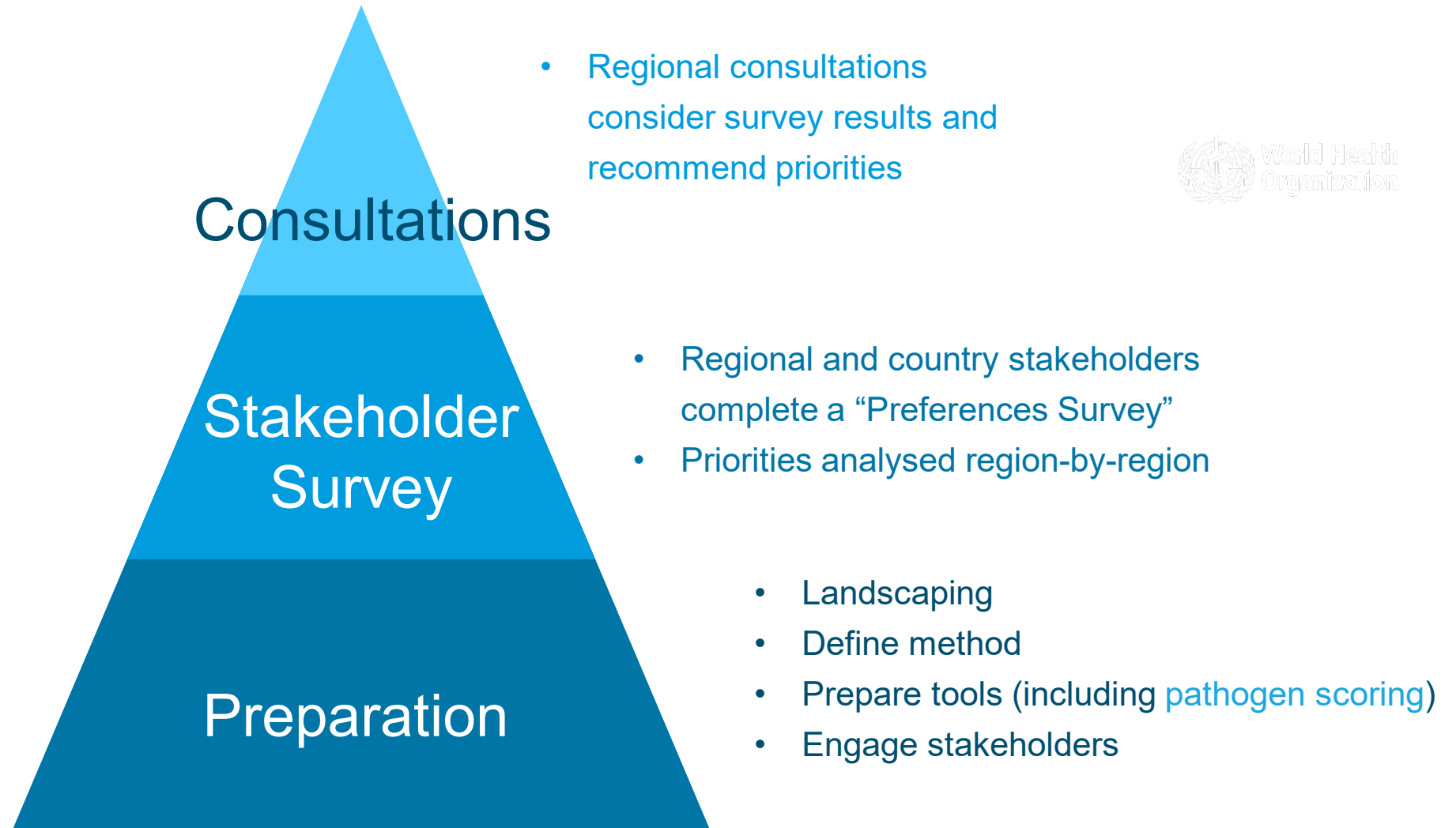
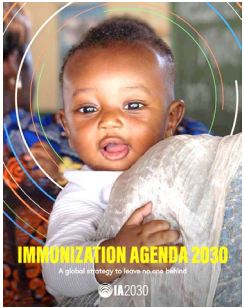


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# Building up to regional consultations



# Contributors

## Methodology advice

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Lydia Kapiriri  
Stacey Knobler  
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## GBD data

Mohsen Naghavi  
Kelly Bienhoff  
Eve Wool

## Translation review

Bader Al Rawahi  
Enric Jané  
Ibrahim Khalil  
Irina Morozova  
Ana Paula Szylovec  
Megan Williamson  
Dina Youssef

## Review of Pathogen Scores

Winston Abara	Michelle Groome
Muhammed Afolabi	Bill Hausdorff
Ahmed Deemas Al Suwaidi	Julie Jacobson
KP Asante	Paul Kaye
Helena Hervius Askling	Ruth Karron
Diana Rojas Alvarez	Sonali Kochhar
Alan Barrett	Kirsty Le Doare
Lou Bourgeois	Jean C. Lee
Jeffrey Cannon	Katharine Looker
Chris Chadwick	Ben Lopman
Kawser Chowdhury	Cal MacLennan
Hannah Clapham	Kim Mulholland
Alan Cross	Harish Nair
Ghassan Dbaibo	Kathleen Neuzil
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Birgitte Giersing	

## Survey dissemination

Sunil Bahl  
Paula Barbosa  
Moredreck Chibi  
Siddhartha Datta  
Peter Figueroa  
Adam Finn  
Qamrul Hasan  
Louise Henaff  
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