



The African
Academy of Sciences



UPDATE – RESEARCH AND DEVELOPMENT GOALS FOR COVID-19 IN AFRICA

The African Academy of Sciences Priority Setting Exercise



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Research and Development goals for COVID-19 Africa

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INTRODUCTION

On 11th March 2020, the World Health Organisation (WHO) declared the outbreak of a new type of Coronavirus, SARS-CoV-2 that causes COVID-19 respiratory disease, a global pandemic. The WHO also published [A Coordinated Global Research Roadmap: 2019 Novel Coronavirus](#) [1] in March 2020 in collaboration with the Global Research Collaboration for Infectious Disease Preparedness and Response (GLOPID-R) – an international network of funders to facilitate coordination and information sharing. The report presented a Global Research Roadmap with immediate, mid-term and longer-term priorities aiming to build a robust global research response based on the outcome of the Global Research Forum held on 11-12 February 2020 by the WHO and the Global Research Collaboration for Infectious Disease Preparedness and Response (GLOPID-R). The meeting consensus pointed to the ‘need for research to focus on actions that can save lives now and facilitate action so that those affected are promptly diagnosed and receive optimal care; while integrating innovation fully within each research area’.

The team of experts summarised the research areas as below;

1. Virus: natural history, transmission and diagnostics;
2. Animal and environmental research on the virus origin, and management measures at the human-animal interface;
3. Epidemiological studies;
4. Clinical characterization and management;
5. Infection prevention and control, including health care workers’ protection;
6. Candidate therapeutics R&D;
7. Candidate vaccines R&D;
8. Ethical considerations for research and;

9. Integrating social sciences in the outbreak response.

Experts identified critical knowledge gaps and research priorities. They shared scientific data on ongoing research, thereby accelerating the generation of critical scientific information to contribute to the control of the COVID-19 emergency.

In Africa, the African Academy of Science (AAS) conducted a consultative webinar followed by a survey based on the WHO Roadmap to define African research priorities for the COVID-19 outbreak. The [Research and Development goals for COVID-19 in Africa](#) report was published on 24th April 2020 [2]. This report proposed a prioritization list for research and development for the COVID-19 outbreak in Africa. The findings were that African researchers largely supported the WHO Roadmap research priorities, but also identified a list of additional sub-priorities of relevance to the African health and research environment.

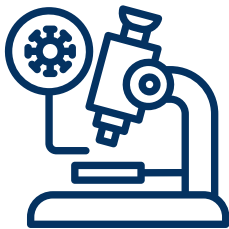
The landscape of Covid-19 research needs and research outputs continues to change [3] with possibilities of research breakthroughs [4] converting into significant reported findings [5] in some areas. There needs to be a concerted effort to continually review the priorities for Covid-19 research and development as events unfold. The AAS in partnership with AUDA NEPAD, together with The Global Health Network (TGHN) and The United Kingdom Collaborative on Development Research (UKCDR) therefore conducted a survey to update the initial list of priorities identified in Africa. This updated list will promote the use of funding to currently relevant global priorities, with particular consideration to LMICs as designated in the World Bank list [6].

In this report we present a summary of results for responses from researchers across the African continent.

AIM

This project provides an update to the COVID-19 research priorities in Africa. It consolidates current thinking in this area recognizing the evolving nature of the outbreak and the applicable control measures.

Objectives



To identify which immediate COVID-19 research priorities are most important



To identify which longer-term research priorities necessary to build the research capacity to deal with future pandemics of either COVID-19 or other pathogens are most important



To identify new research priority areas not captured in the WHO Research Roadmap or the AAS survey so far

The chance to compare the African data with that from other LMICS is not discussed here but will be the subject of a separate report.

METHODS

Survey design

The online survey ‘*Research Priorities for COVID-19*’ questions were developed following the structure of the WHO Research Roadmap *Midterm and long-term priorities to contribute to control the outbreak* summary table with the addition of the new research priorities identified by the AAS during their webinar and subsequent survey.

The survey had an introductory page providing information on the aim of the survey and how the data collected would be used and clarified that the participation was voluntary with the right to withdraw at any time. Consent to participate was implicit for all individuals that “opted in” to complete the survey.

The survey consisted of three sections. The first section collected demographic details. In the second and third sections, participants ranked their top three options within nine topic areas for both immediate and longer-term priorities (18 total ranking questions). Participants also had the opportunity to indicate in open response questions any priorities that might not have been

captured for each one of the topics.

The online survey was created and distributed through the online survey tool Jisc. The online survey was piloted within a small team of researchers and global health experts who reported no difficulty interpreting and responding, and no obvious survey omissions.

Survey distribution

The survey invitation was disseminated by TGHN e-Newsletter sent to all registered users, and through Twitter, Facebook and LinkedIn. AAS and UKCDR supported the dissemination of the survey to all their members. Participants were not compensated for survey completion.

The English version of the survey was launched on 11th May 2020 17:00 BST. The Spanish, Portuguese and French version were launched on 15th May 2020 23:00 BST. The survey was closed on 22nd May 2020 10:00 am BST. Survey responses were collected for a period of 12 days.



The survey had an introductory page providing information on the aim of the survey and how the data collected would be used and clarified that the participation was voluntary with the right to withdraw at any time. Consent to participate was implicit for all individuals that “opted in” to complete the survey.

DATA ANALYSIS



Research categories ranked as “priority one” were given a score of 3, “priority 2” were given a score of 2, “priority 3” were given a score of 1 and those not selected as a priority were given a score of 0. Each priority was ranked based on the sum of all the scores.

The Jisc online survey platform gathered the data into a spreadsheet format for basic statistical analysis. The survey questions were designed to ensure that only completed ones could be submitted as responses. Data was anonymized, password protected and access was restricted to the project team. Quantitative descriptive statistical analyses were undertaken within excel to provide a priority score for each research category. Research categories ranked as “priority one” were given a score of 3, “priority 2” were given a score of 2, “priority 3” were given a score of 1 and those not selected as a priority were given a score of 0. Each priority was ranked based on the sum of all the scores. This analysis was conducted within each topic area. Although respondents only ranked their top three priorities the summative scores allows all questions under a single heading to be assigned a ranking score but these cannot be used to compare across the nine different WHO defined broad categories.

Open-ended survey responses aimed to determine whether there are new priorities that were not included in the original WHO roadmap and AAS survey findings. These free-text responses were imported into NVivo qualitative data analysis package and we undertook a pragmatic ‘thematic content analysis’. Responses were coded deductively following categories using:



Group 1 - WHO priorities outlined in the WHO COVID-19 Research Roadmap and priorities emerging from the AAS findings (as listed in the survey questions)



Group 2 - New research priorities that would fit within the WHO COVID-19 Research Roadmap topics



Group 3 - New research priorities that would not easily fit within the WHO COVID-19 Research Roadmap established topics

The analysis focused on the new research priorities included in group 2 and group 3 to identify emerging themes. Responses such as ‘not applicable’ and duplicate answers from the same respondent were discarded hence, 535 of 854 short-term responses and 103 of 350 long-term responses were coded. Some longer-term priorities included within the immediate priorities section were recoded back to long term priorities and vice versa. Data specific for Africa was analyzed separately and are reported here.

RESULTS

There were 623/1528 responses from Africa/LMICS. We show the Africa results below. Note Africa includes all AU countries (ie it is not restricted to the WHO African region).

QUANTITATIVE DATA

Demographics

Two-thirds of the survey participants were male with nearly a third identifying themselves as infectious disease experts. About 20% of the participants had experience in policy advice, whilst the majority of the participants were between 30 and 49 years old. Interestingly, about 40% of the participants identified themselves as Research leaders or Post-doctoral researchers validating

the focussed reach of this survey. Most of the participants had either Biomedical/laboratory sciences or Clinical/epidemiological sciences research experience, but we should note that the social and behavioural expert representation was at 9%. We, therefore, need to consider these results in these contexts. Additionally, most of the participants had an expert professional interest in the subject under discussion with about 40% from Academia and 13% from Non-Governmental Organizations.

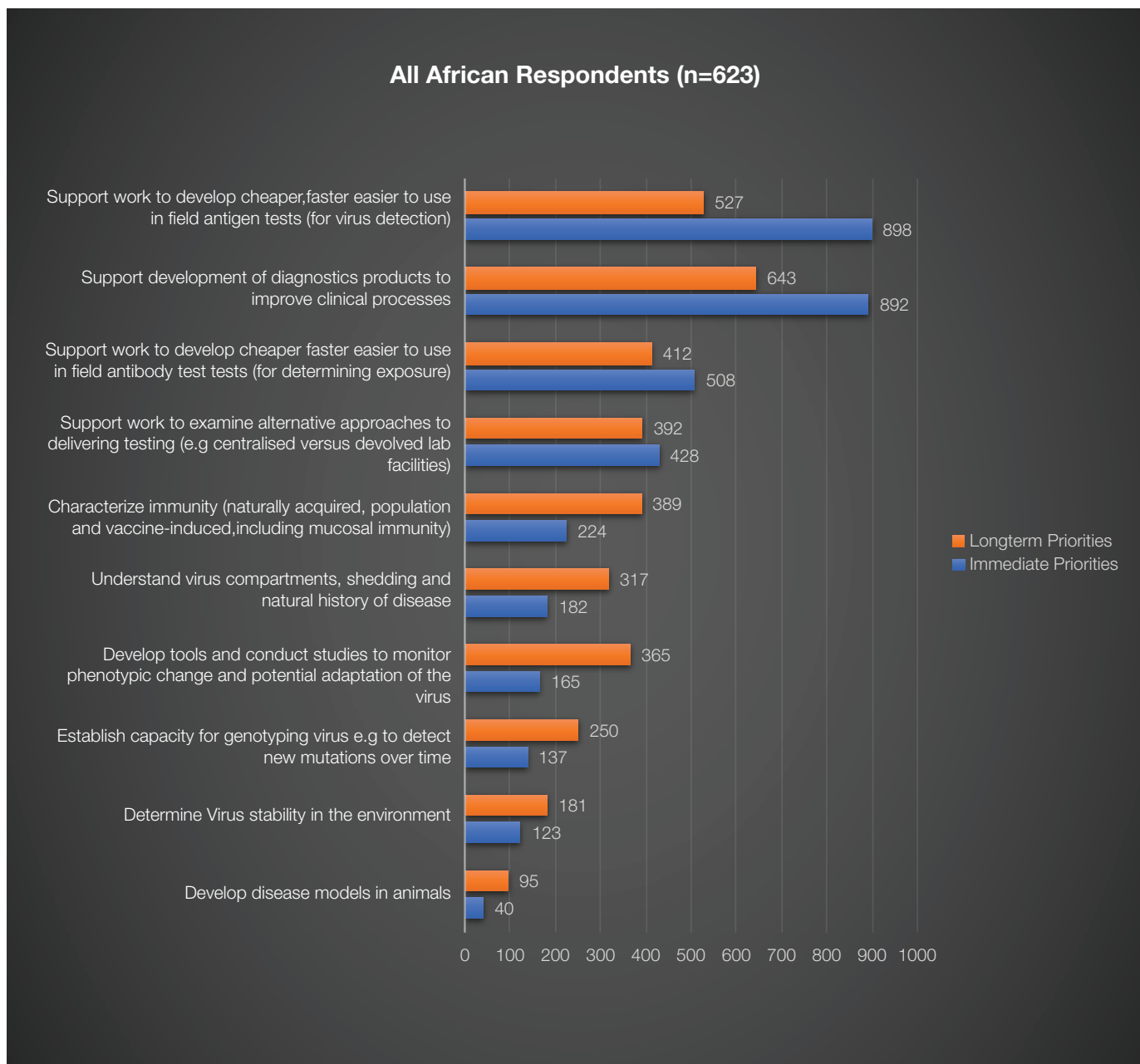
Participants came from the following countries in Africa. See chart 1 below.

Country	Total	Country	Total
BF - Burkina Faso	6	ML – Mali	2
BJ – Benin	4	MW – Malawi	18
BW – Botswana	7	MZ – Mozambique	6
CD - Congo, Democratic Republic of	9	NG – Nigeria	93
CG - Congo, Republic of the	1	RW – Rwanda	8
CI - Cote d'Ivoire	9	SD – Sudan	3
CM – Cameroon	27	SL - Sierra Leone	6
DZ – Algeria	3	SN – Senegal	4
EG – Egypt	3	SO – Somalia	3
ET – Ethiopia	39	SS - South Sudan	2
GA – Gabon	2	SZ – Swaziland	3
GH – Ghana	24	TN – Tunisia	2
GM - Gambia, The	5	TZ – Tanzania	24
GN – Guinea	1	UG – Uganda	56
KE – Kenya	144	ZA - South Africa	73
LR – Liberia	6	ZM – Zambia	12
LS – Lesotho	1	ZW – Zimbabwe	16
MG – Madagascar	1		

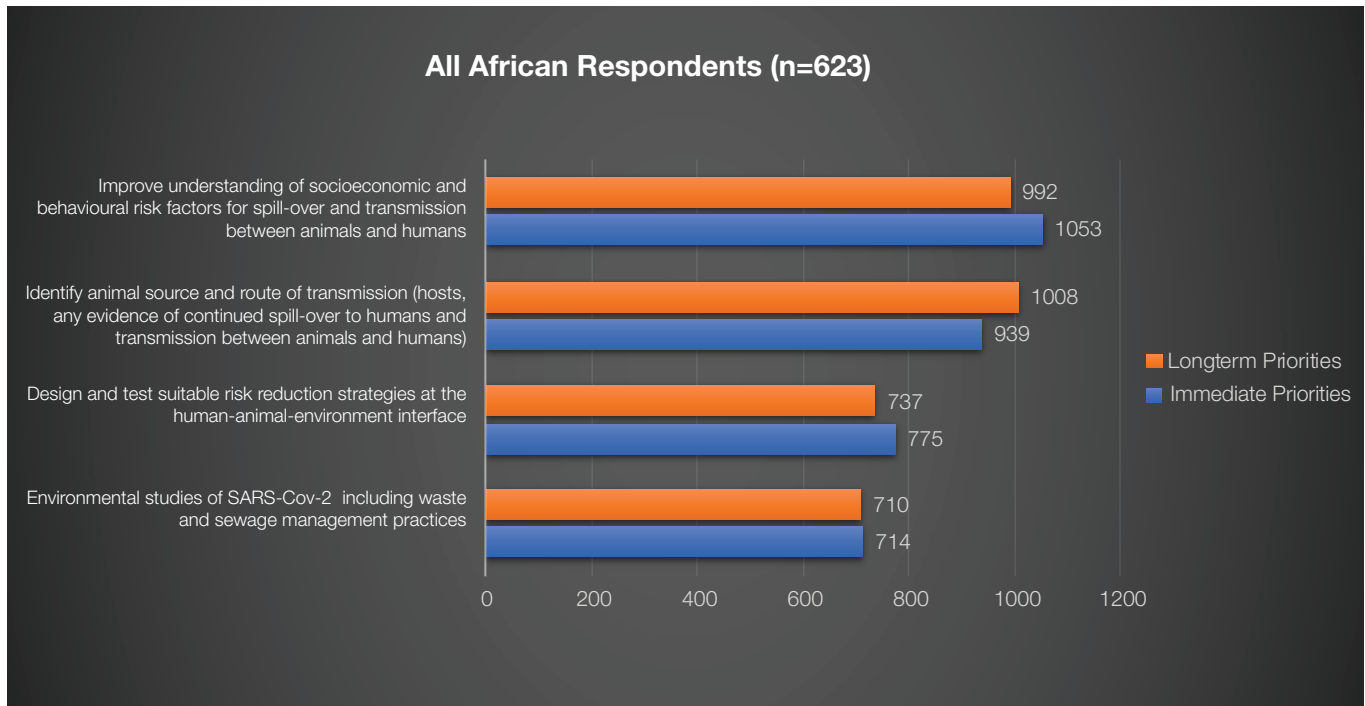
Analysis note: The following weights were given to priorities according to how the participants chose the top three priorities.

- Priority 1 = 3; Priority 2 = 2; Priority 3 = 1; No priority = 0

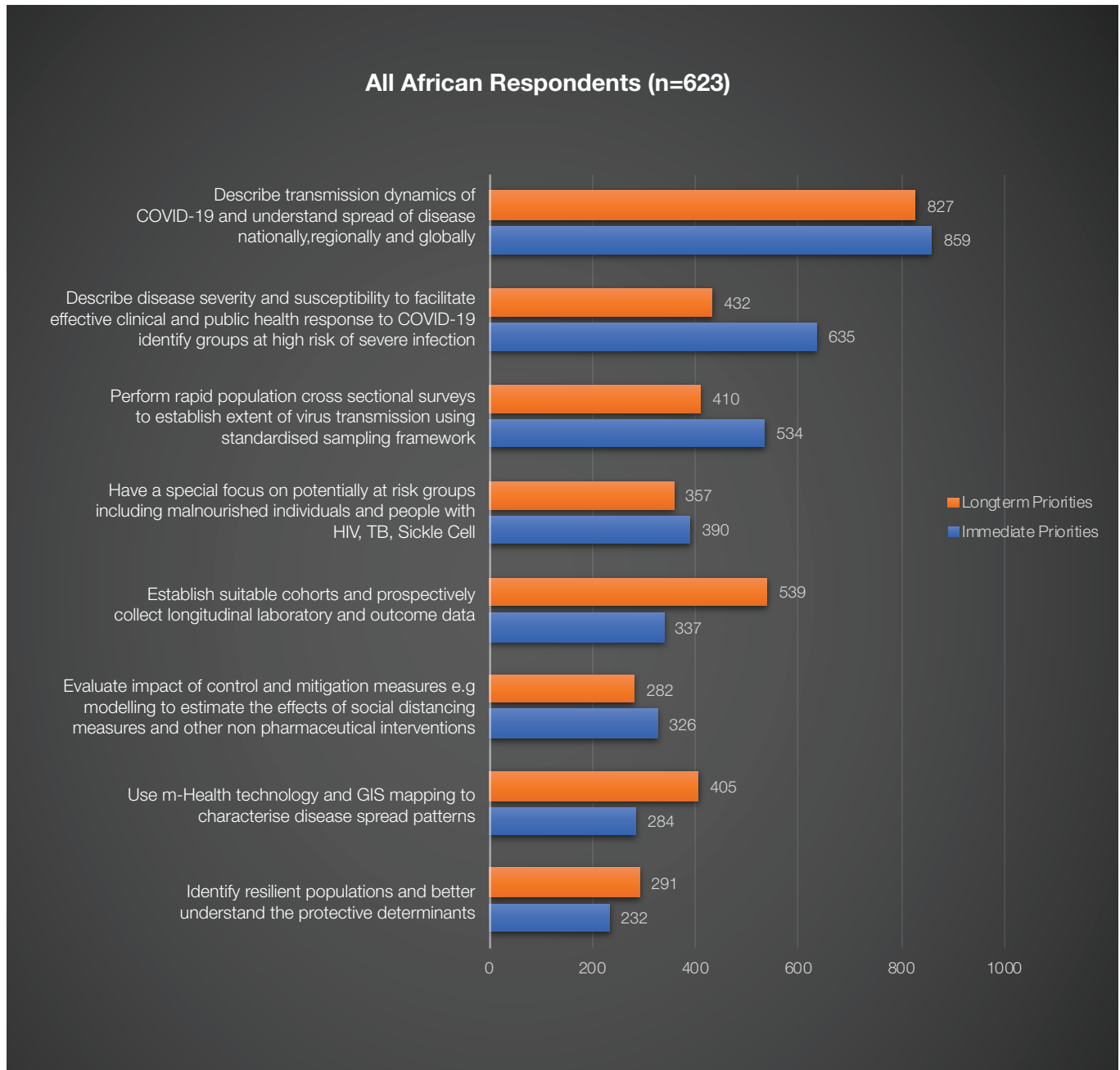
1. Virus natural history, transmission and diagnostics



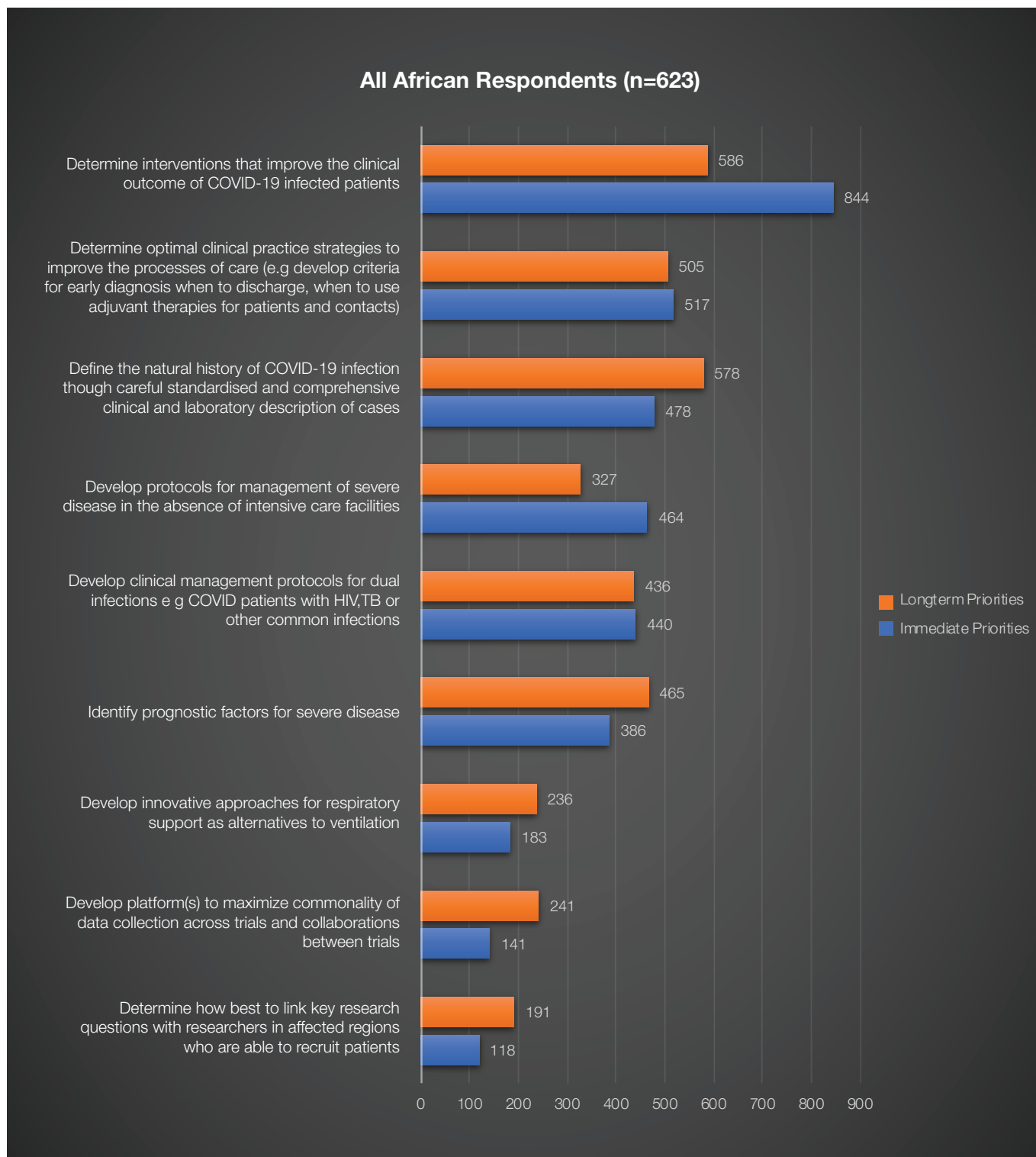
2. Animal and environmental research on the virus origin, and management measures at the human-animal interface



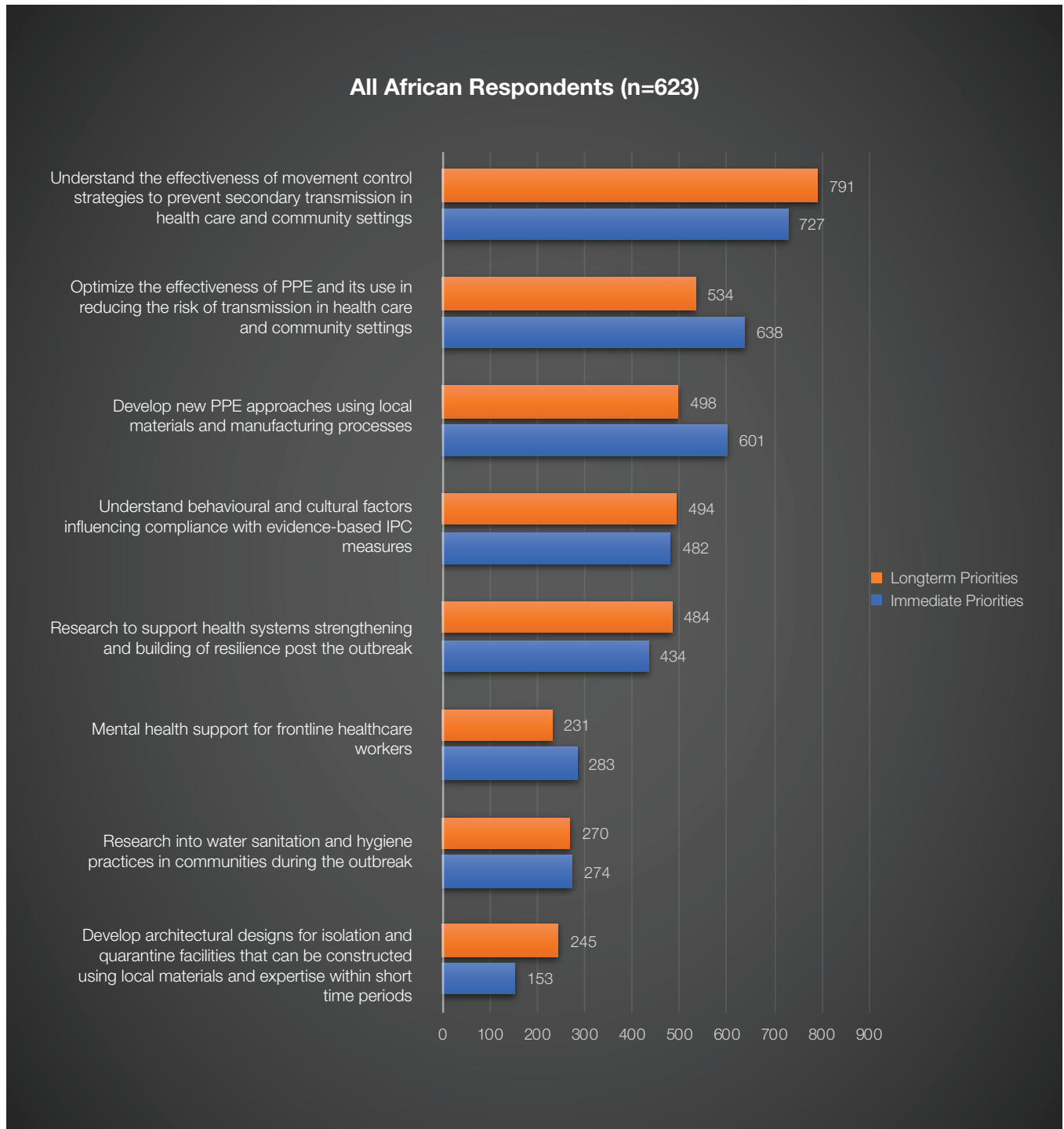
3. Epidemiological studies



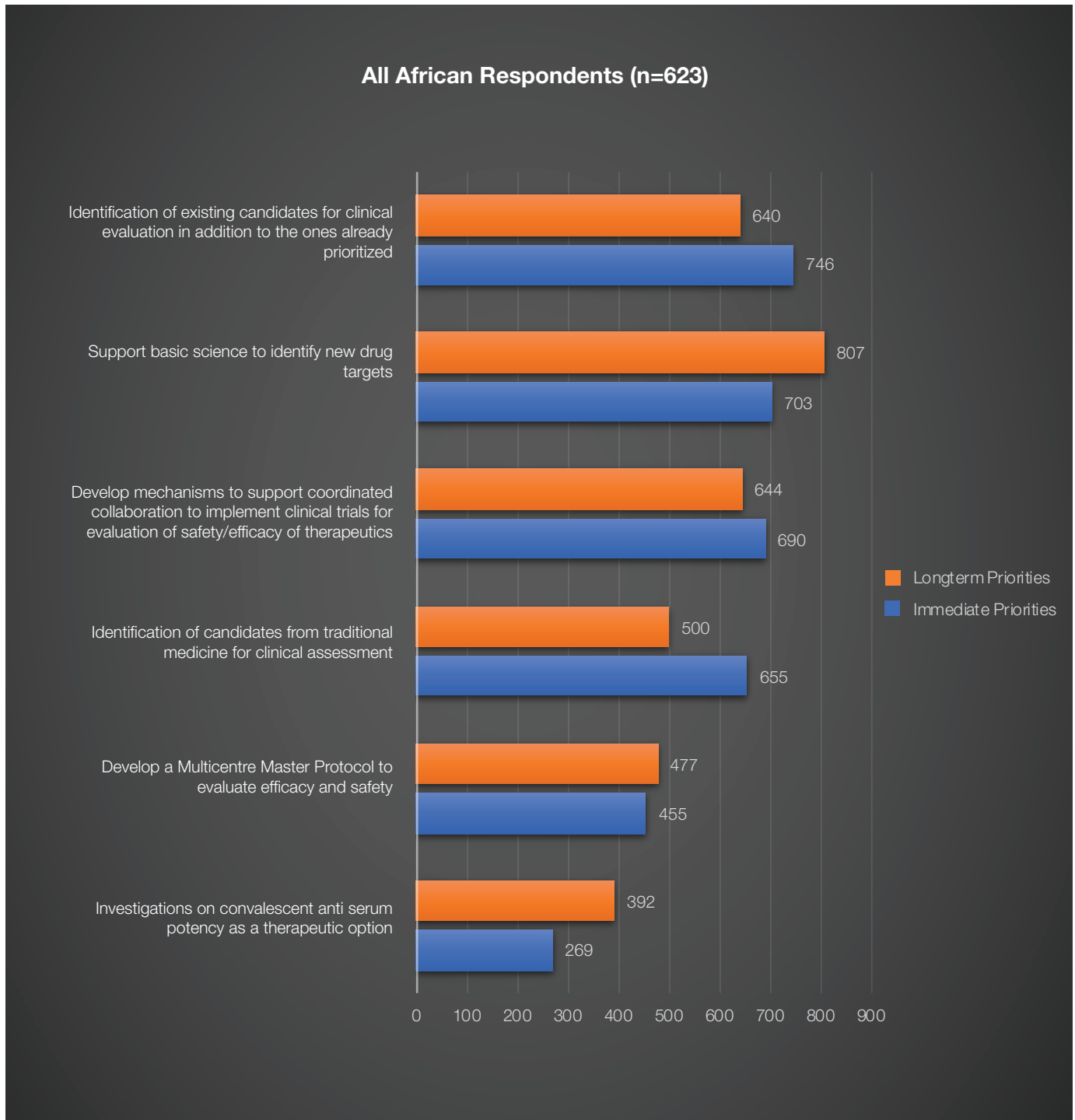
4. Clinical Management



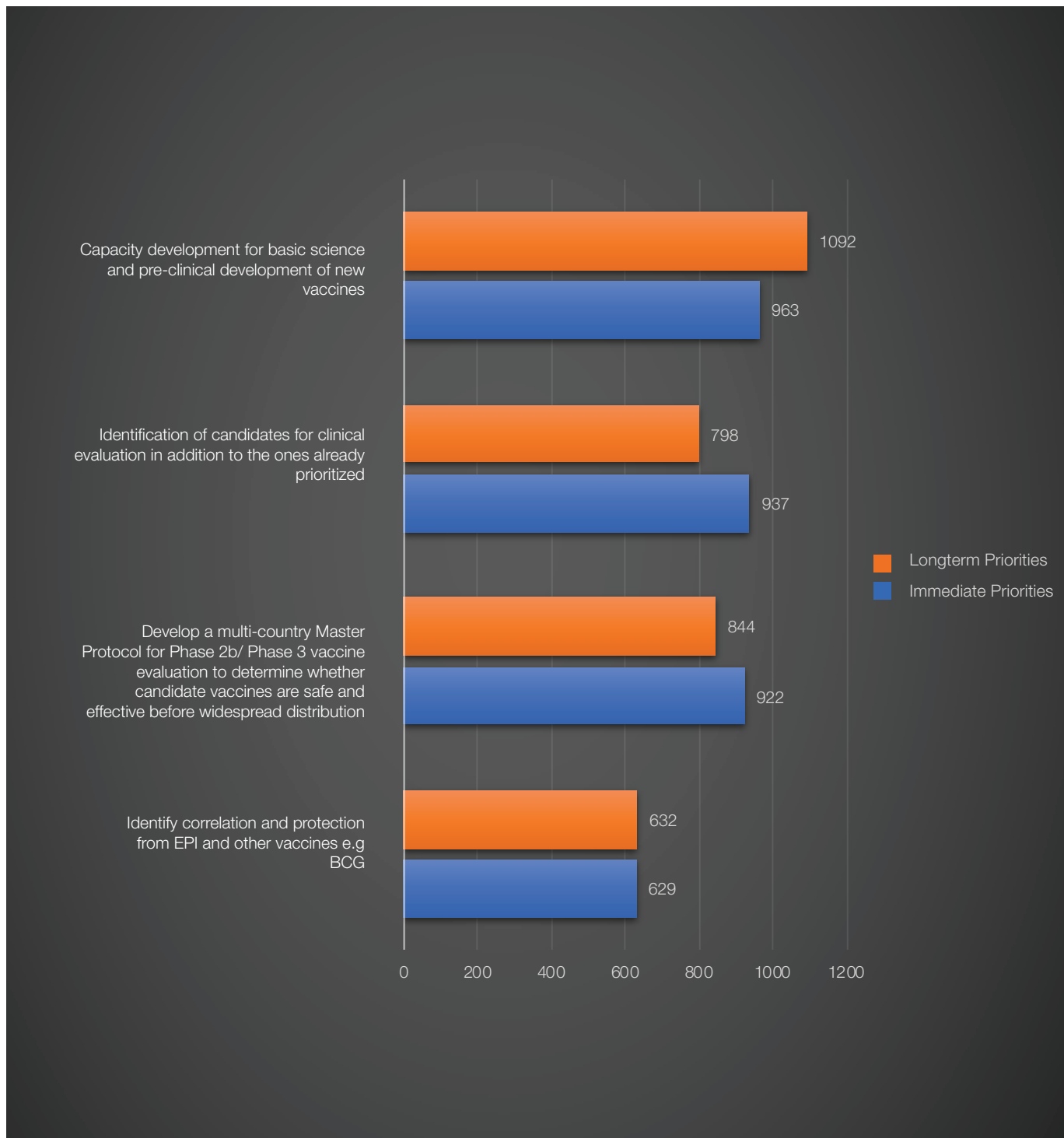
5. Infection prevention and control, including health care workers' protection.



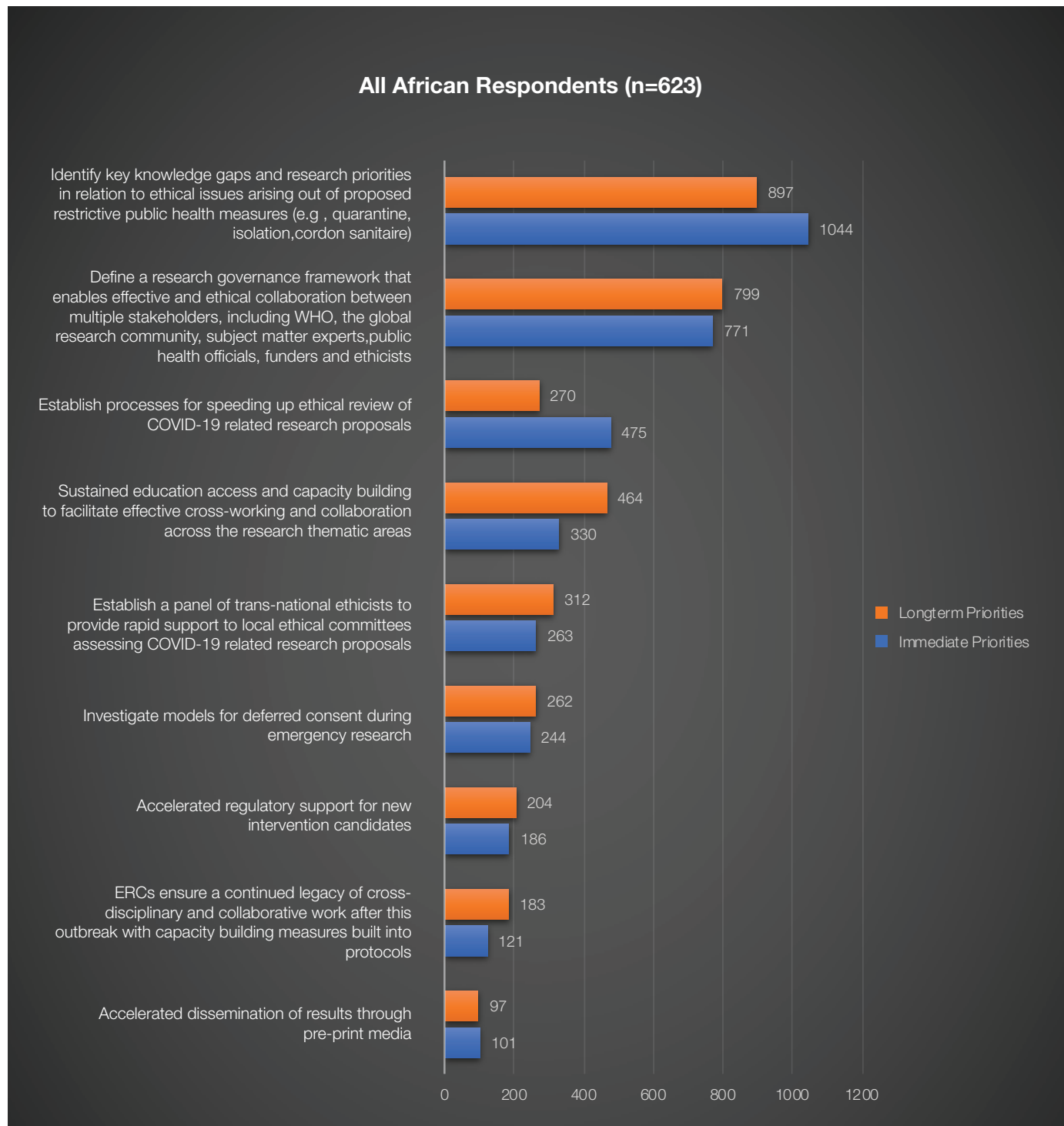
6. Candidate therapeutics Research & Development



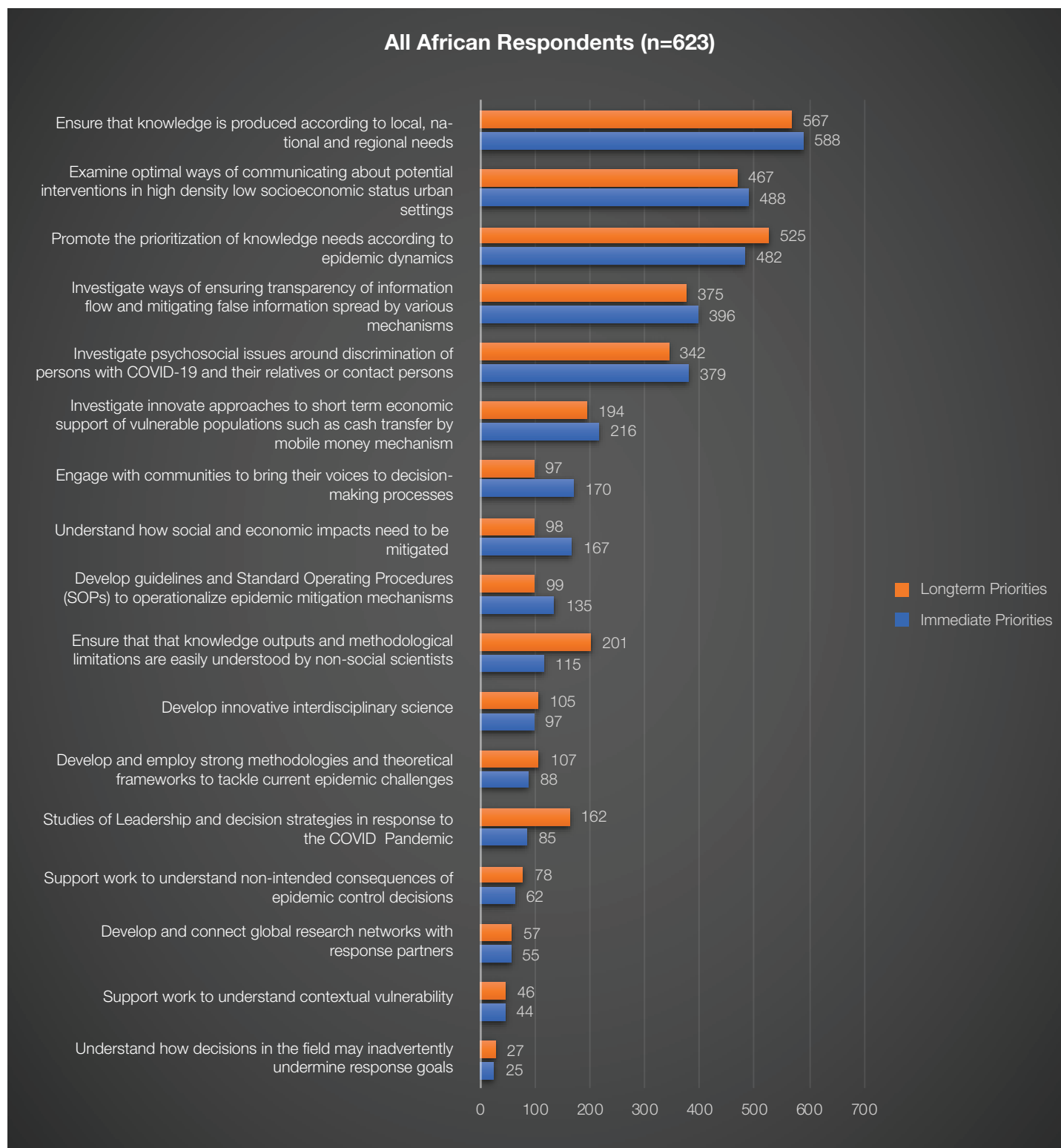
7. Candidate vaccines Research & Development



8. Ethics Considerations for Research



9. Social Sciences in the Outbreak Response



QUALITATIVE DATA

The survey had free text boxes aimed at capturing any new thoughts not included in the original WHO roadmap or the first AAS survey findings. These written comments were imported into NVivo qualitative data analysis package and a pragmatic thematic content analysis done.

This is an additional simple listing of potential priorities from individual contributors that do not correspond to any of the

fixed text priorities. The list was, therefore, not validated through a ranking process like those in the quantitative analysis. Three groups of potential priorities are listed in the findings. The first two are those that correspond to the immediate and long-term priorities as grouped by the WHO/GLOPID-R report. The third group is a listing of those priorities that do not fit into the original 9 categories.

A. Immediate priorities that fit into the 9 WHO roadmap categories: The survey identified the following immediate priorities from the free text;

Epidemiological studies: Examine relationships to other lung diseases, e.g. Tuberculosis, Lung Cancer, Sarcoidosis, Idiopathic Pulmonary Fibrosis
Clinical management: Evolved from WHO priority 4d - Clinical guidelines for post-hospitalization home management and community rehabilitation.
Ethical considerations for research: Ethical considerations for resource allocation to LMICs
Social Sciences in the outbreak response Understanding COVID-19 in the contexts of conflict, civil war, and refugee situations
Candidate Therapeutics Investigate the potential role of natural/alternative/herbal/traditional remedies and practices in treatment of COVID19

B. Long-term priorities that fit into the 9 WHO roadmap categories: There were some new longterm priorities identified through this process as below;

Epidemiological studies Research into long term health impacts and complications of contracting COVID-19 – with emphasis on children/those with comorbidities
Clinical Management The effects of the global response to COVID-19 on management and prevalence of other infectious diseases, such as TB/HIV/Chikungunya

C. New priorities that do not fit into the original 9 WHO roadmap categories

The environmental impact of the response to COVID-19
The impact of control measures on the environment including air pollution and carbon dioxide emissions.
A)The impact of control measures on the environment including air pollution and carbon dioxide emissions.
The environmental effects of disinfectants and hand sanitizers used to control the infection.
Environmental impacts of large-scale PPE production and disposal
Preparing for the next pandemic
Ensure effective measures including community surveillance are in place to rapidly identify emerging zoonotic diseases by developing animal screening techniques (e.g. of bats/migrating birds)
Evaluation of governmental policies and lessons learnt in preparation for the next pandemic

CONCLUSION

This data suggests that the original WHO COVID-19 Research Roadmap remains broadly globally applicable and applicable in Africa. This work has also revealed that the priority list may keep expanding or changing as the outbreak and its' control measures evolve. It is therefore imperative that the research community and policymakers continue to assess the changing priorities as new data emerges.

There is need to provide continuous scientific support to Covid-19 outbreak management teams and their policy partners so that they can make evidence-based decisions. The decisions will however need to be reviewed regularly to keep them relevant and protective as the outbreak is changing quickly and the opinions

and collective wisdom of the scientists is changing as well. The policies cannot therefore be static.

This data therefore supports the importance of the WHO research roadmap approach and highlights areas where funders and researchers should place emphasis. New areas with great potential to change the course of the outbreak control should be monitored closely. Lastly, it is not enough to write out priorities if they cannot be implemented. We actively need to engage with the priorities as a community of scientists in Africa and pick out those priorities that we can address as individuals, institutions, consortia, nations or regions.

LIMITATIONS

There were a number of limitations to our approach. Using the nine broad headings of the WHO blueprint meant that the numbers of potential priorities to be ranked varied significantly; in some case such as research on the animal environment interface, these were few whereas in others, such as the social science response, there were many. The approach to ranking within

a heading doesn't allow us to compare priorities across headings. Finally we observed in some cases that a higher number of research topics listed towards the top of the provided lists were chosen as more relevant and in future work it would be desirable to vary the order of topic presentation.

CONTRIBUTORS

The AAS partnered with AUDA NEPAD, UK CDR and The Global Health Network (TGHN) at Oxford University to deliver the second Covid-19 survey. In the AAS the Covid-19 project is co-Chaired by Professor Kevin Marsh and Dr Moses Aloba. Inputs from AUDA NEPAD were coordinated by Professor Aggrey Ambali and Ms Daphine Muzawazi. The UK CDR group was led by Dr Marta Tufet and Dr Alice Norton and the TGHN team by Professor Trudie Lang. Many people contributed to the design and implementation of the project and we would particularly like to thank Arancha De La Horra Gozalo, Nicole Feune De Colombi, Emilia Antonio, James Parker, Zainab Al-Rawni, Colette Adhiambo, Wayne Mwangi, Juliette Mutheu-Asego and Charles Njagi.

APPENDIX 1

List of questions used during the survey

AAS TGHN UKCDR Research Priorities for COVID-19 in LMICS - QUESTIONS

<https://drive.google.com/file/d/1ZsFSF9ngKjksU8-vOuzfTbwubSFfd3PJ/view?usp=sharing>

APPENDIX 2

DEMOGRAPHIC DATA FROM THE SURVEY PARTICIPANTS

1.0 Demographics

1.1 Gender

Gender	Africa (AAS) (n=623)		Infectious disease control expert (n=225)		Experience in policy advice(n=137)	
	Count	%	Count	%	Count	%
Female	207	33.2	60	26.7	49	35.8
Male	414	66.5	164	72.9	87	63.5
Other	0	0	0	0	0	0
Prefer not to say	2	0.3	1	0.4	1	0.7

1.2 Age

Age	Africa (AAS) (n=623)		Infectious disease control expert (n=225)		Experience in policy advice (n=137)	
	Count	%	Count	%	Count	%
20-29	88	14.1	19	8.4	14	10.2
30-39	229	36.8	87	38.7	45	32.8
40-49	161	25.8	60	26.7	40	29.2
50-59	89	14.3	39	17.3	18	13.1
60-69	45	7.2	17	7.6	15	10.9
70+	11	1.8	3	1.3	5	3.6

APPENDIX 2

1.3 Research career stage

Research career stage	Africa (AAS) (n=623)		Infectious disease control expert (n=225)		Experience in policy advice (n=137)	
	Count	%	Count	%	Count	%
PhD, medical or other student or earlier	161	25.8	62	27.6	23	16.8
Post-doctoral researcher	83	13.3	35	15.6	37	27
Research leader	163	26.2	73	32.4	40	29.2
Member of a research team	153	24.6	41	18.2	20	14.6
Other	63	10.1	14	6.2	17	12.4

1.4 Research experience

Research experience	Africa (AAS) (n=623)		Infectious disease control expert (n=225)	
	Count	%	Count	%
Biomedical / laboratory sciences	219	35.3	114	50.7
Clinical or epidemiological sciences	307	49.3	138	61.3
Social and behavioural sciences	86	13.8	50	22.3
Policy advice (i.e. if you either advise on or are responsible for health/ research strategy)	137	22.0	52	23.3
Other	202	32.5	14	6.2

APPENDIX 2

1.5 Expertise in disease control

Expertise in disease control	Africa (AAS) (n=623)		Experience in policy advice(n=137)	
	Count	%	Count	%
Having an expert professional interest	358	57.5	41	29.9
Having a general professional interest	225	36.1	85	62
Neither of the above	40	6.4	11	8

1.6 Organization or healthcare work setting

Organisation or health work setting	Africa (AAS) (n=623)		Infectious disease control expert (n=225)		Experience in policy advice (n=137)	
	Count	%	Count	%	Count	%
Academia (university, college,...)	261	41.9	108	48	83	60.6
Commercial Research Organisation	8	1.3	3	1.3	3	2.2
Community Health Centre/Facility	17	2.7	2	0.9	1	0.7
Consultancy	12	1.9	2	0.9	3	2.2
Government Ministry	23	3.7	9	4	1	0.7
Government research organisation	55	8.8	18	8	10	7.3
Hospital (Private)	23	3.7	7	3.1	2	1.5
Hospital (Public)	53	8.5	21	9.3	5	3.6
Industry (including Pharma)	3	0.5	2	0.9	1	0.7
International organisation (IGO)	19	3	7	3.1	4	2.9
Journal / Publishing company	0	0	0	0	0	0
Non-government organisation (NGO)	85	13.6	25	11.1	12	8.8
Public Health institute	21	3.4	10	4.4	3	2.2
Regulatory organisation	2	0.3	0	0	0	0
Other research organisation	21	3.4	5	2.2	5	3.6
Self-employed	4	0.6	2	0.9	1	0.7
Unemployed	9	1.4	2	0.9	0	0
Other	7	1.1	2	0.9	3	2.2

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