

## Data sharing in Public Health Emergencies to maximise health benefits- the role for the GloPID-R funders.

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Commissioned by: Wellcome Trust on behalf of the GloPID-R data sharing working group.

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Enhanced data sharing in Public Health Emergencies (PHEs) can result in significant public health benefit. The GloPID-R funders have developed Data Sharing Principles in order to underpin this process for future PHEs. This review surveyed GloPID-R funders to determine and analyse their current policies and practice and future plans in support of enhanced data sharing in PHEs. Examples of best practice are highlighted as well as barriers and bottlenecks to this endeavour. The following recommendations are given (and expanded in Section 4), for GloPID-R funders to work together on alongside external partners, in order to support the GloPID-R Data Sharing Principles and Statements with aligned funder policies:

- 1. GloPID-R funders should work together to develop a consistent definition of when heightened requirements for data sharing should be activated (which isn't necessarily restricted to the trigger of declared PHEs or PHEICs).*
- 2. GloPID-R funders should work towards aligning their policies for data sharing in PHEs, to require sharing of quality assured interim and final data in PHEs in real time (within one month) and ensure that the grant holders this applies to uphold this requirement in their Data Management Plans (wherever feasible considering ethical, legal and commercial obligations).*
  - 2b. Where funders cannot include rapid data sharing requirements in policies, these should instead be included in grant conditions for both grants awarded in PHEs and grants awarded which may have relevance to future PHEs.*
- 3. GloPID-R funders should work together to develop consistent expectations, support and guidance for the development and enforcement of Data Management Plans.*
- 4. GloPID-R funders need to align to support data management training, data management resources and data sharing platforms in this area.*

## 1. Introduction

Data sharing is increasingly an expectation from research, with many funders and journals requiring it following publication in order to improve research impact. In the case of Public Health Emergencies (PHEs) a requirement for heightened and rapid sharing of research data in advance of publication has been widely identified as a key component of epidemic preparedness<sup>1,2,3</sup>. Timely data sharing is predicted to accelerate health benefits through facilitating research projects, reducing the duplication of work and enhancing the global communities' ability to effectively respond to, coordinate and manage response strategies for disease outbreaks.

This need for timely data sharing in PHEs, does however need to be balanced against a range of ethical, legal and social considerations<sup>2</sup>. The quality of the data to be shared (at a range of stages from raw data, to interim results and final research results) needs to be assured, to ensure the correct decisions can be made based on it.

Timely data sharing has certainly occurred in the recent Public Health Emergencies (Zika and Ebola) and case studies are being developed to demonstrate this (commissioned by GloPID-R data sharing group). There is however a clear need to further encourage, enable and require timely data sharing to enable health benefits to be maximised in future PHEs.

### Statements

The global community has taken a range of steps to encourage timely data sharing in recent PHEs. Statements from research funders and journals at the time of the recent Zika (2016) and Ebola (2018) epidemics have publicly committed to the following<sup>4,5</sup>:

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*Statements on data sharing in PHEs have committed to:*

*Journal signatories making all content concerning the virus free to access.  
Any data or preprint deposited for unrestricted dissemination ahead of  
submission of any paper will not pre-empt its publication in these journals.*

*Funder signatories requiring researchers undertaking work relevant to  
public health emergencies to set in place mechanisms to share quality-  
assured interim and final data as rapidly and widely as possible, including  
with public health and research communities and the World Health  
Organization.*

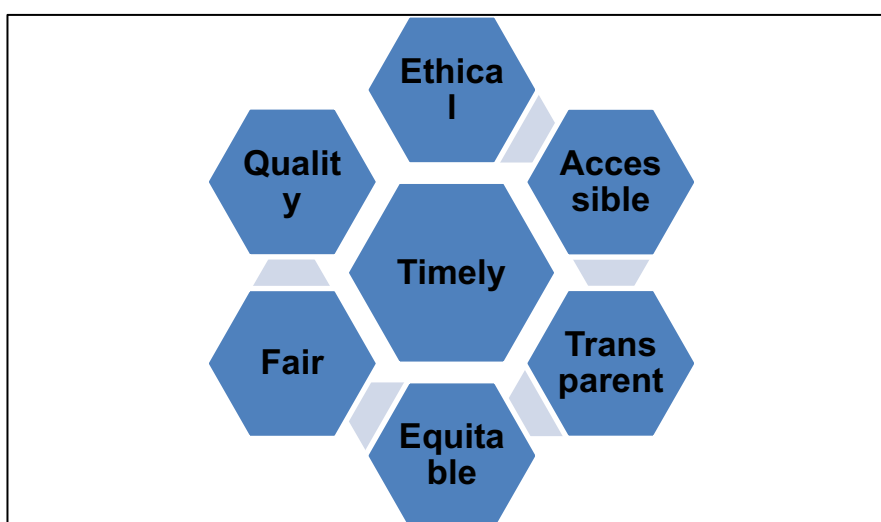
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There have also been commitments to encourage sharing of early results, through pre-prints defined as complete and public drafts of scientific documents, yet to be certified by peer review<sup>6</sup>.

### GloPID-R

GloPID-R is a network of 27 research funding organisations in the area of infectious disease preparedness research, as well as the World Health Organisation (WHO) and the Coalition for Epidemic Preparedness Innovations (CEPI)<sup>7</sup>. Together, these funders intend to develop a system for data sharing in PHEs which can support the scientific research response. There is little information publicly available on how researchers and organisations share data, the extent to which these data are used and whether the quality of the data is appropriate to advance knowledge and inform decision making related to the response. The GloPID-R funders have commissioned a study to highlight data sharing case-studies.

GloPID-R have developed a list of Data Sharing Principles to underpin future implementation of timely data sharing<sup>8</sup>. These principles are intended to support the development of systems for data sharing in PHEs that can be recognised by and adhered to by all stakeholders.



*Figure i. GloPID-R Data Sharing Principles for Public Health Emergencies*

### Funders policies

Funders policies on data sharing in PHEs can encourage or require enhanced data sharing in line with the agreed principles. By establishing funder policies and alignment of language, researchers will have more guidance and be better placed to ensure that their data is being shared effectively and appropriately.

This report analyses results from a survey of GloPID-R funders to review current policies, practices and future plans for data sharing in general, open access policies and enhanced data sharing in PHEs. Recommendations are provided to align funder policies and practices in order to support the Data Sharing Principles.

## 2. Current Funders Policies, Guidance, Practice and Impact

The methods of the survey are outlined in Annex A. In total responses from 15 funders were obtained (through a combination of a written survey and telephone survey). Annex B. provides an overview of the survey data for all funders.

### Data sharing policies and practice

Table One summarises the existence of data sharing, rapid data sharing in PHEs, outputs sharing policies and grant conditions for the funders surveyed. It also notes those funders who stated an intention to update some aspect of these policies.

A high proportion 80% (12/15) of the funders have a data sharing policy in place or in the final stages of completion. In reality, these range from limited policies encouraging data sharing for certain data types (eg. genomic) to general policies requiring data sharing for all data types.

The same proportion 80% (12/15) of funders had an open access publication policy in place (this was not the same twelve funders). There was again a range in these policies from the most stringent requiring open access at time of publication, to the least stringent encouraging open access publication.

Fewer funders 40% (6/15) had policies or grant conditions in place referring to enhanced or rapid data sharing in PHEs. This was however the policy area where most funders expressed an intention to review and potentially update their policies or grant conditions. Of those funders with policies in place for data sharing in PHEs, some stated that data sharing is encouraged as rapidly as possible, whereas for example the EC set a time limit requiring data sharing within one month in PHEs. Table Two gives the details available on rapid data sharing policies or grant conditions in PHEs.

There was a clear appetite for considering revisions to these policies with nine of the funders expressing plans to update their policies or grant conditions in these areas. Some funders had reviews underway with clearly established plans to implement future policies relating to data sharing or data sharing in PHEs. Other funders stated explicitly that they were keen to incorporate the results from this report into their future plans which were not yet developed.

*Table i: Summary of funders data sharing policies and practice*

<b>FUNDER</b>	<b>DATA SHARING</b>	<b>RAPID DATA SHARING (PHES)</b>	<b>OPEN ACCESS POLICY</b>	<b>PLANS TO UPDATE?</b>
Wellcome Trust, UK	Yes (linked to outputs management plan)	Yes (as rapidly as possible)	Require open access publication within 6 months (from 2020 requirement will be immediate and requires publication of findings ahead of peer review where there is a significant public health benefit)	Yes
Department for International Development, UK	Yes (no time expectation)	Yes (often grant conditions through linked funders)	At least 60% publications open access	Yes
UKRI Medical Research Council, UK	Yes (linked to data management plan)	No	Require open access publication within 12 months study ending	No
European Commission	Yes (requirement)	Grant conditions (within one month)	Require open access publication	Yes
Institut Pasteur, France	Yes	No	n/a	n/a
German Federal Ministry for Education and Research (BMBF)	No	No	Open access publication encouraged	No
Bill and Melinda Gates foundation, USA	Yes	No	Require open access at time of publication	Yes
Canadian Institutes of Health Research, Canada	Yes encouraged (linked to data management plan)	Grant conditions for relevant grants (as rapidly as possible)	Require open access publication	Yes
IDRC, Canada	Under development	No	Require open access publication	Yes
Japan Agency for Medical Research and Development	Yes (genome data only, linked to data management plan)	No	Yes	Yes
National Health and Medical Research Council, Australia	Yes (encouraged)	Yes (rapid)	Require open access publication within 12 months	No
Indian Council of Medical Research	Yes	No policies (but do give guidance)	Encourage publication	No
National Institute of Health Carlos III	Clinical research results	No	No	Yes
African Academy of Sciences, Kenya	Yes (almost in place)	No	Yes (almost in place)	Yes
National Research Foundation of Korea/ S. Korea	No	No	No	?

*Table ii: Funders Policies and Grant Conditions on Rapid Data Sharing in PHEs*

FUNDER	DATA SHARING WORDING
Canadian Institutes of Health Research, Canada	In grant conditions for relevant grants. The <a href="#">Team Grant: Canada-Latin America-Caribbean Zika Virus Program</a> <sup>9</sup> funding opportunity states that: <i>"Applicants should be prepared to share quality-assured interim and final data as rapidly and widely as possible, including with public health and research communities and the World Health Organization, as outlined in the Statement on Data Sharing in Public Health Emergencies</i> <sup>2</sup> . The <a href="#">Rapid Research Fund for Ebola Virus Disease Outbreaks</a> <sup>10</sup> funding opportunity states that: <i>"Applicants must be committed to publishing research findings in the public domain in accordance with IDRC's and the Tri-Agency's open access policies, as well as with public health and research communities and the World Health Organization, as outlined in the Statement on Data Sharing in Public Health Emergencies"</i> .
European Commission	Grant conditions in the context of a PHE have the obligation to share data rapidly. <i>"the proposal shall foresee, in case of public health emergencies, open access to data at the moment it is generated or no later than one month thereafter subject to any safeguards required to protect research participants and patients, in accordance with the relevant options in Article 29.3 of the Model Grant Agreement."</i> Also, an option outside PHE, if there is an outbreak of an emergency can identify projects that have data relevant to a PHE and can ask them to share the data from that research. <a href="http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-bhc-13-2019.html">http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sc1-bhc-13-2019.html</a> <sup>11</sup> .
National Health and Medical Research Council, Australia	In general data sharing policy <i>"A further example in which sharing of data is crucial is during public health emergencies. Public health emergencies are special cases where rapid data sharing may be necessary to facilitate an effective response to a crisis. As a member of the Global Research Collaboration for Infectious Disease Preparedness (GloPID-R), NHMRC acknowledges the importance of sharing data and associated metadata in public health emergencies"</i> . <a href="https://nhmrc.gov.au/about-us/publications/open-access-policy">https://nhmrc.gov.au/about-us/publications/open-access-policy</a> <sup>12</sup> .
Wellcome Trust	In policy on data, software and materials management and sharing: <i>"Where research data relates to public health emergencies, researchers must share quality-assured interim and final data as rapidly and widely as possible, and in advance of journal publication."</i> <a href="https://wellcome.ac.uk/funding/managing-grant/policy-data-software-materials-management-and-sharing">https://wellcome.ac.uk/funding/managing-grant/policy-data-software-materials-management-and-sharing</a> <sup>13</sup> . From our guidance on developing an outputs management plan: <i>"Where research data relates to a public health emergency, quality-controlled data must be shared as rapidly and openly as possible. This is in line with the statement on data sharing in public health emergencies and principles for data sharing in public health emergencies."</i> <a href="https://wellcome.ac.uk/funding/managing-grant/developing-outputs-management-plan">https://wellcome.ac.uk/funding/managing-grant/developing-outputs-management-plan</a> <sup>14</sup> .

### Data sharing impact

Table Three details the examples of impact given by funders. Only those funders who mentioned impact 20% (3/15) are included and many of the respondents did not have this information available at the time of the survey (there are likely to be broader impacts missed by this survey). Although the impacts of data sharing in PHEs are yet to be fully assessed by funders, there are some strong examples here of rapid data sharing in PHEs facilitating the Public Health response, particularly relating to genome data. These results will complement the case studies commissioned by the GloPID-R group.

*Table iii: Summary of data sharing impact reported by funder*

FUNDER	DATA SHARING IMPACT
Wellcome Trust, UK	2016 Zika statement had an impact on journal policies to ensure research relating to PHEs was immediately open access and publishing was fast-tracked.  Real time genome sequencing and data sharing helped to understand unusual transmission routes in the tail end of the Ebola epidemic. See: <a href="https://wellcome.ac.uk/press-release/sexual-transmission-involved-tail-end-ebola-epidemic">https://wellcome.ac.uk/press-release/sexual-transmission-involved-tail-end-ebola-epidemic</a> <sup>15</sup>
Department for International Development, UK	Possibly the plague outbreak in Madagascar. Ebola vaccine project.
European Commission	Genome sequencing projects in the Ebola- 2014 outbreak immediately shared the sequences, which helped the vaccine, diagnostic and treatment developers. Immediate data sharing with WHO/MSF. Ebola vaccine project in real time communication with WHO.
Not yet attributed to a funder	Lassa genome sequence sharing in 2018 helped to understand the increase of Lassa fever in Nigeria (by disproving the theory that the virus had mutated to become more easily transmissible in humans). <a href="http://virological.org/t/new-lassa-virus-genomes-from-nigeria-2015-2016/191">http://virological.org/t/new-lassa-virus-genomes-from-nigeria-2015-2016/191</a> <sup>16</sup>

### 3. Analysis of funders policies and future plans for data sharing in PHEs

#### Policies and grant conditions

Four of the fifteen funders surveyed provided examples of policies or grant conditions mentioning the need to share data rapidly in PHEs (with six out of the fifteen indicating they had them). Several other funders expressed an intention to include this in future policies or grant conditions.

The difference between whether these statements are in policies or grant conditions can be important. Most funders confirmed that their grant conditions required funding recipients to follow their published policies. Referring to the need for rapid data sharing in PHEs in policies therefore ensures that this is covered for all grants made by that funder. Some funders however expressed that this requirement was too specific to be included in their policies (which were often institution wide and some-times multi-institution). These funders instead included (or planned to include) wording relating to the need for rapid data sharing in PHEs in relevant grant conditions. In most cases this would equate to the same result, however in cases where relevant research is funded prior to a PHE and an appropriate policy is not in place, the researchers may not be held to any such conditions. Funders could provide persuasive encouragement to such researchers to share data (and the researchers would likely do so anyway), however the EC has provided a backup grant condition for all grants which requires them to share data rapidly if it turns out to be relevant to a PHE to address this issue.

### Trigger for rapid data sharing

All funders policies or grant conditions referred to a PHE (with some funders verbally commenting on a link to the declaration of a Public Health Emergency of International Concern (PHEIC) by the World Health Organisation) as the trigger for their 'rapid' data sharing conditions. The definition of this PHE trigger was not well articulated in any of the policies but is assumed to relate to the WHO definition. Further definition of these triggers is necessary and important in considering when policies will be activated.

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*The WHO defines:*

**Public Health Emergency** (the condition that requires the governor to declare a state of public health emergency) as "an occurrence or imminent threat of an illness or health condition, caused by bio terrorism, epidemic or pandemic disease, or (a) novel and highly fatal infectious agent or biological toxin, that poses a substantial risk of a significant number of human fatalities or incidents or permanent or long-term disability (WHO/DCD, 2001). The declaration of a state of public health emergency permits the governor to suspend state regulations, change the functions of state agencies."<sup>17</sup>.

**Public Health Emergency of International Concern** is defined in the International Health Regulations (2005) as "an extraordinary event which is determined, as provided in these Regulations: to constitute a public health risk to other States through the international spread of disease; and to potentially require a coordinated international response". This definition implies a situation that: is serious, unusual or unexpected; carries implications for public health beyond the affected State's national border; and may require immediate international action<sup>18</sup>.

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One funder stated that they were unable to sign the 2018 Ebola statement, despite having signed the 2016 Zika statement, since the Ebola outbreak had not been declared a PHEIC by the WHO and therefore they would not be able to enforce their rapid data sharing policy. The 2018 Data Sharing Statement on Ebola opened with the statement '*Although it has not yet been designated a public health emergency of international concern, the current Ebola outbreak in the Democratic Republic of Congo represents a serious and rapidly developing threat to public health*'<sup>5</sup>.

This highlights a potential bottleneck in linking the trigger for these policies (and other measures in this field) specifically to the PHEIC or even PHE definitions. Whilst rapid data sharing is clearly beneficial in PHEIC and PHEs, there are also many outbreaks or epidemics and even inter-epidemic periods (for epidemic prone pathogens) where rapid data sharing of early research conducted may enable a response which ultimately prevents a PHE/PHEIC.

The PHE (or PHEIC) trigger although useful, may be limiting, and more discrete triggers for enhanced data sharing could be developed for research on certain epidemic prone pathogens.

### Rapid data sharing requirements

The existing policies and grant conditions vary in their definition of 'rapid' data sharing. Most funders conveyed that it was important for data to be shared as close to 'immediately' as possible, however highlighting the considerations limiting this ambition. Limitations cited included: quality assurance processes; safeguards to protect research participants and patients' confidentiality; ethical, legal and commercial obligations; equity in research and not jeopardising publication. Some funders clearly set a time-limit (EC states one month) on 'rapid data' sharing to make their expectations clear (despite acknowledging the potential limitations). Advanced data planning and restricted access arrangements were cited as an appropriate way to address some of these limitations. Indeed, Data Management Plans (DMPs) could be a key tool to accelerate the speed of 'rapid' data sharing in PHEs.

DMPs are required by most of the funders surveyed either at the grant application or award stage (including funders with no data policies or grant conditions). These can be a key enabler in implementing rapid data sharing policies, grant conditions or guidance and facilitating data sharing. Some funders provide support in developing these data sharing plans, but this could be a key area for further capacity building. The quality of funder review of these data management plans will also be important in ensuring rapid data sharing.

### Other linked activities by funders

Beyond enhanced data sharing policies, funders are undertaking a range of activities to support rapid data sharing in PHEs. All the funders are members of the GloPID-R consortium, which intends to develop a system for data sharing in public health emergencies which can support the scientific research response. Many of the funders were signatories to one or both 2016 Zika or 2018 Ebola statements on data sharing in public health emergencies.

One funder cited offering a data management learning module for researchers and several funders cited supporting a range of data sharing repositories and rapid publication and pre-print platforms. Several funders mentioned the use of harmonised data study protocols in cases where they had funded several studies in the same PHE. One funder is exploring the possibility of DOIs for data sets (so that they become published and citable) and could be listed on cvs. It was notable however that these activities appeared fragmented, with few funders citing the same data management support systems, data sharing repositories or rapid publication platforms.

Two funders mentioned the San Francisco statement declaration on research assessment (DORA) to encourage reviewers to take account of the full range of research outputs.

### Perceived ongoing barriers

Several ongoing barriers to rapid data sharing were clearly identified as: research equity; research protection (remaining concern about data release jeopardising future publication); lack of recognition (academic incentives) from publishing data-sets; data-quality and data-standardisation.

Many of these barriers could be addressed with effective DMPs supported by trusted data sharing systems. There is a need for standardised processes and appropriate platforms through which data can be made available and shared with an appropriate level of access.

Research protection is already being addressed through statements from research publishers, but this needs to be expanded. Recognition will need sustained effort from both funders and the University system.

### Future plans

GloPID-R's work in this area is timely with nine of the fifteen funders expressing interest in updating some aspect of their data sharing policies. European country funders expressed plans to further align with the newly developed EC policies. Many other funders intended to update their policies or grant conditions to include mention of the need for rapid data sharing in PHEs.

#### 4. Recommendations

The following four recommendations from this review are provided for GloPID-R funders to work together on (alongside external partners), in order to support the GloPID-R Data Sharing Principles and Statements with aligned funder policies:

- 1. GloPID-R funders should work together to develop a consistent definition of when heightened requirements for data sharing should be activated (which isn't necessarily restricted to the trigger of declared PHEs or PHEICs).**

*This review has identified a potential bottleneck in enhanced data sharing caused by using the trigger of a declared PHE or PHEIC. The aim of GloPID-R's data-sharing work is to ensure rapid data sharing where it may result in significant public health benefit. Rapid data sharing may be beneficial in certain outbreaks or epidemics which don't meet the criteria for PHEs or PHEICs or even in inter-epidemic periods. In these cases, rapid data sharing may even enable a response which prevents a PHE or PHEIC. A starting point would be to focus on enhanced data sharing conditions for research involving pathogens with epidemic potential.*

- 2. GloPID-R funders should work towards aligning their policies for data sharing in PHEs, to require sharing of quality assured interim and final data in PHEs in real time (within one month) and ensure that the grant holders this applies to uphold this requirement in their Data Management Plans (wherever feasible considering ethical, legal and commercial obligations).**

*Providing a time limit for data sharing in PHEs will help give both clarity and parity for researchers working in this field. Within one month is the highest standard currently used by GLOPID-R funders. Any exceptions and access restrictions due to ethical, legal and commercial obligations can be detailed in grantees' DMPs approved by the funders. If GloPID-R funders can align their policies they will have strong influence over other funders and journals.*

- 2b. Where funders cannot include rapid data sharing requirements in policies, these should instead be included in grant conditions for both grants awarded in PHEs and grants awarded which may have relevance to future PHEs.**

*Certain funders cannot include rapid data sharing requirements for PHEs in policies where the policies are institution wide or multi-institution. There is a need to ensure grant conditions cover the scenario that relevant research is funded in advance of a PHE.*

**3. GloPID-R funders should work together to develop consistent expectations, support and guidance for the development and enforcement of Data Management Plans.**

*Effective DMPs are a clear enabler for rapid data sharing policies. DMPs need to be reviewed at the grant application stage and should clearly state how ethical, legal and commercial limitations will be dealt with and how data will be shared in alignment with rapid data sharing policies.*

**4. GloPID-R funders need to align to support data management training, data management resources and data sharing platforms in this area.**

*The need for capacity development in data management has been highlighted by this review alongside the need for trusted data management resources and sharing platforms. Establishing and improving these prior to future PHEs is necessary. Alignment between GloPID-R funders in investment into training platforms, data management resources and data sharing platforms would likely accelerate and enhance their development and use.*

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## 6. Acknowledgements

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## Annex A. Methods

This review was based on results from both a written and telephone survey of GLoPID-R funders.

### Written survey

In 2017 a survey was sent by email to research funders within GLoPID-R and to signatories of the Joint Statement on Data Sharing that was signed in the context of the Zika virus outbreak. The survey sought to discover whether funders included guidance on data sharing in policies, grant conditions or other forms of guidance given to recipients of funding. Only four responses were received, with one further response giving some information regarding data sharing without specifically answering the questions. These responses were from Wellcome Trust, European Commission, Institut Pasteur, Canadian Institutes of Health and TDR.

### Telephone survey

In September- October 2018, Alice Norton conducted a semi-structured telephone survey of GLoPID-R funders using the question set below (which was based on the question set used for the written survey). All GLoPID-R funders were invited to participate and 14 took part in the survey. For those few funders who completed both the written and telephone survey, the telephone survey was used as an opportunity to update the results from the written survey. Data from the telephone survey was collected through recordings and contemporaneous notes.

Data was collated from the written and telephone survey (15 funders in total) and analysed in excel.

### **Question set for GLoPID-R member survey**

#### **1. Defining respondents**

*Respondent information/ organisational profile*

- a. Name & position of respondent in organisation
- b. Email address
- c. Name & country of organisation
- d. Type of organisation (public/ private/ non-governmental)
- e. Role of organisation in research in Public Health Emergencies (PHEs)

#### **2. Data sharing across all research**

*Covering organisation's policies, grant conditions and guidance relating to data sharing in general.*

- a. Is there any specific reference to 'data sharing' (or equivalent wording) in your
  - i. current organisation policies
  - ii. grant conditions
  - iii. other guidance for funding recipients

- b. Do your current policies require the registration of
  - i. clinical trials or
  - ii. other types of research
- c. Do your current policies include requirements that outputs arising from grants including publications, data, protocols and other research outputs should be publicly available or sharable?
- d. Do you have any plans to update these policies, grant conditions or guidance? If so, please briefly outline your plans and timescales as far as you are able.

### **3. Public position on data sharing in public health emergencies (PHEs)**

- a. Has your organisation made any public statement(s), (including position papers or statements to the media) on rapid data sharing in public health emergencies? If so, please provide details.
- b. Is your organisation a signatory of any multi-organisation statements on data sharing in public health emergencies (such as the 2016 Statement on Zika or 2018 statement on Ebola)?

### **4. Facilitating data sharing in PHEs**

*Covering organisation's current specific policies, grant conditions, guidance and experience relating to rapid data sharing in PHEs.*

- a. Is there any specific reference to 'rapid data sharing in public health emergencies' (or equivalent wording) in your
  - i. current policies
  - ii. grant conditions
  - iii. guidance for funding recipients
- b. Do you have any mechanisms in place to incentivize researchers to share data in PHEs (e.g. recognition)?
- c. Do you have any mechanisms in place to incentivize researchers to rapidly share study results in PHEs?
- d. Do any of the mechanisms that you have in place monitor sharing of data related to PHEs (e.g. through grant conditions)?
- e. Do any of the mechanisms that you have in place prepare researchers to share data in PHEs (eg. harmonised study protocols & data sharing protocols)?
- f. Can you give any examples of outputs, outcomes or impact resulting from data sharing by your grantees in PHEs (with reference to timing, how the data was shared, the extent to which it was used and the quality of the data)?
- g. To what extent do you think your policies, grant conditions or guidance have facilitated data sharing in PHEs?

### **5. Future plans for data sharing in PHEs**

- a. What do you believe are the ongoing barriers to data sharing in PHEs?
- b. Do you have plans to require or specifically encourage rapid data sharing for public health emergencies in the future through:
  - i. policies
  - ii. grant conditions
  - iii. broader advocacy activities
  - iv. tools to support mechanisms for rapid data sharing (e.g. data platforms & repositories)
  - v. tools to support rapid results publication (e.g. pre-prints)

### **6. Anything else?**

Annex B. Overview of Survey Results (see separate excel spreadsheet)