Data Challenge Prizes for Health: a Playbook

May 2020

What is this playbook for?

This playbook has been designed to help you identify and scope a 'challenge prize' to help drive innovative uses of data in health. Challenge prizes are just one method but there are many others to choose from, depending on what you are looking to achieve. This playbook provides advice on designing challenges that are centred on the use of data in health, and providing tips, methodologies and links to useful resources.

If you are looking for a wider introduction to challenge prizes and how to design and deliver them, we recommend reading the Nesta Challenge Prizes Guide.

We plan to update this playbook as part of future projects, so please send any feedback to info@theodi.org.

Data is moving from being scarce and difficult to process, to being abundant and easy to use – when it is made available in the right way. Data innovation can enable businesses, startups, governments, individuals and communities to create more efficient and effective services and products, fuelling economic growth and productivity. This is particularly true in the health sector, where data innovation can have a big impact on complex health problems.

The first section of the playbook provides guidance on how to identify a problem to be solved through a challenge prize.

The second section takes you through steps to scope out the problem in more detail and to start thinking about how to design your challenge prize. This scoping phase includes step-by-step guidance, suggested tools and processes, and examples.

The third section takes you through some steps to design your challenge prize and summarise the work you've done, including phasing, budgeting and putting a proposition together.

What is a challenge prize?

An open prize in which a financial reward is levied in order to motivate a wide pool of innovators to respond to a specific social or technical 'challenge' or problem which isn't being solved with usual innovation methods and therefore would benefit from a wide pool of innovators looking to tackle the issue with unorthodox thinking or methods.

May 2020

Who is this playbook for?

This playbook is primarily aimed at funders and people working with funders, or other organisations who are looking to solve problem-specific societal challenges related to health, by leveraging data to stimulate innovation.

What do you need to get started?

To start scoping your data challenge prize, we recommend you read the [Nesta Challenge Prizes Guide](#) as a broader introduction to challenge prizes and also have:

- An initial idea or an area of expertise, interest or passion for a data-driven solution
- A team that can work on scoping the challenge prize and topic. We recommend the following skill sets:
  - Project management
  - Research
  - Consultancy
  - Communications
- Access to funding or an idea of where you might get funding from for running the challenge prize, including incentives and prizes

If you don't have a specific idea, but can see the value of driving health data innovation, it is important to identify the range of potential problems and verify them with a wide community of experts and stakeholders. This requires an initial phase of scoping and discussion through workshops, interviews and desk research with health practitioners, researchers, data scientists, policy makers, communities, patients and carers from the region you are looking to run the health data challenge prize in.

How to use this framework

We hope this playbook will give you:
- an understanding of how to identify your challenge topic and problem
- tools and guidance on how to understand the data landscape and build a model which enables you to best leverage data to support your challenge prize.

Tip: Expect to deliberate and iterate
It may seem like there's a lot to do before starting to think about the prize, but investing time in understanding the context of your challenge will enable you to improve its design, which will make it more impactful.

It is likely that in the initial scoping phase your challenge prize idea will change. As you carry out deeper enquiries into your prize area, you may shift and refine the focus of your
May 2020

prize. This is to be expected. Sometimes you will need to investigate a different aspect of the problem or opportunity. Sometimes you might need to redraft your aims because new insights emerge about the opportunities and constraints around the challenge. You might also find the conditions are not right for a prize. See this work as iterative and plan a series of events and activities (roundtables, workshops or focus groups) that help you to test your early thinking with different people.

May 2020

Section one: Identify your data challenge prize topic and problem

Every successful data challenge prize starts with a well-defined problem. There are many problems that need to be addressed in healthcare. However, not all of them will be effectively addressed through the use of a challenge prize. Challenge prizes resolve some of the barriers to innovation by offering an incentive to a broad range of people to produce innovative solutions. However, sometimes a lack of innovation might not be the key issue.

In this section, we outline:

- Some criteria that you can check your idea against, to see if it is suitable for a health data challenge prize.
- How to write a problem statement to articulate your challenge in a single statement. You can then use this to continually refer to, and revise, as you scope the problem out.

Characteristics of health data challenge prize problems

Following are some characteristics of the types of problems that are most suitable for a health data challenge prize (this might not always be the best approach – you can find out about different types of innovation methods in the Nesta Challenge Prizes Guide).

1. **Direct societal relevance**
   A good health challenge prize problem needs to attract a wide pool of potential innovators. It therefore needs to have wide societal relevance so that different practitioners from different disciplines will understand the problem and be motivated to try and contribute to solving it.

   Health challenge prize problems need to be big enough to attract participants who can think about the project differently and bring different approaches and techniques to the solutions. However, make sure that it is not so big that you won't be able to clearly describe and measure the impact of your challenge prize.

2. **Can be addressed through the use of data**
   A good health challenge prize problem will focus on addressing an existing health problem through the use of data in a new way. This could mean using new techniques in processing and using health data, or combining health data with other less traditional data sources.

   The topic area and region you are running it in therefore needs to have at least some data available on the problem area and a technical and regulatory data

infrastructure to enable access to that data by challenge participants. Health data is highly sensitive, so access is often restricted and subject to rigorous governance. You will need to be able to work with data stewards to enable access or the creation of synthetic data to support participants.

3. **Measurable solutions**

   The health challenge prize problem needs to have a solution that is measurable and that enables you to set time-bound targets to measure the progress you're making. In order to demonstrate the value of these types of activities, you need to have something to show at the end of the prize which interests other funders and partners to invest and galvanise further work on the projects.

4. **Problems need to have coordinated efforts around them**

   Some problems will have lots of people working away at them from different angles and perspectives. This is great in some ways as it means there is clearly a problem to be solved, but it might also mean that efforts aren't as coordinated or progress can't be made as quickly as it could if people worked together.

   Running a challenge prize allows you to invite lots of different people to apply and provides an opportunity to bring different skill sets together.

You may have a specific challenge topic in mind. If so, consider your challenge topic in the light of the criteria above. It is likely that you will not have a full picture of the above as yet. The next steps in the playbook will help you to add more detail and to sense-check whether the problem is the right one to focus on.

Challenge statement

It is a good idea to articulate the challenge in a single statement that can then be reviewed regularly throughout the process. For example:

"In England, 1 in 6 people report experiencing a common mental health problem (such as anxiety and depression) in any given week. But current interventions for anxiety and depression are only 50% effective. This challenge seeks to support solutions that use data and artificial intelligence to improve the efficacy of mental health interventions, approaches and techniques."

The statement must describe the problem and how big it is, and then what the challenge prize is going to do to solve it without predetermining what solutions will look like. It is also good to include some statistics where possible, what current interventions there are (if any) and to make sure it is broad enough to iterate on as you go further through the scoping process.

Section two: Understand the data landscape

What? A data landscape review is the process of mapping out the key data and data-related resources that exist in a specific sector or domain. These include datasets, publishers, publishing outlets and tools.

Why? A data landscape exercise can help to identify the range of datasets being used to help solve challenges, to highlight the role that specific datasets have in addressing multiple challenges, with a view to later ensuring they are as open as possible. Ultimately, this helps you identify how much data is actually available to work with and if a data challenge for this topic is feasible.

Outputs: You can expect to create some of the following outputs from a data landscape review:

- A list of key stakeholders and their capacities.
- An overview summary of the legal, regulatory and cultural context.
- A data inventory of key datasets.
- A data ecosystem map. This will show the data and value flows in the challenge area and help identify the informational gap in enabling decision-makers at different levels to make better decisions.

We suggest the following activities to create an initial data landscape review:
- Research a significant body of work on the topic and pull together the key definitions, figures and issues within the field.
- Speak to experts and practitioners you have identified to verify and add detail to your desk research.
- Review the legal, regulatory and policy context of the topic.
- Map the stakeholders, data flows and value flows.
- Make an inventory of the available data which you can use in your health data challenge, and assess its accessibility for participants.

Tip: Sequence of activities
You do not need to complete each activity before starting the next, but activities such as literature reviews and interviews can make creating stakeholder maps and data inventories much easier.

Undertake desk research on the challenge topic area

Why? It is important to clearly articulate the idea you have for the challenge topic. With desk research, you will be able to:

- understand and analyse the latest information on the topic and challenges related to it
- identify any previous or ongoing initiatives to draw from, or any initiative that will cover, or has already covered, what you had in mind
- start identifying key stakeholders to interview (we recommend interviewing stakeholders in parallel to undertaking desk research – see next section)
- start identifying key data sources.

Output: A document with a list of key reference papers and summary notes

Start by reading the key research and relevant white papers and reports you can find online which discuss the topic. In order to find such information, you might want to start with:

- general web searches
- reports and evidence from patient and civil society groups
- academic literature in the relevant domain to look for datasets being published or cited in the literature.

It is advised that you do this even if you know the area very well, as you want to ensure research papers are as up to date as possible and relevant to the region you are thinking of running the prize in. The key things to look out for are:

- evidence of the scale of the problem (for example, "existing treatment in this area is only 50% effective")
- key terms and definitions
- evidence and key blockers to why this problem isn't already being solved through traditional research and healthcare practices
- key stakeholders and experts in the field.

Once you have completed this review, reflect on the information you have gathered and try to revise the statement you had for the challenge.

Tip: Staying up to date
Research papers are published all the time, and it can be hard to stay informed of the latest findings. After gathering sufficient evidence, scale back active desk research, and use automated updates and subscriptions to ensure you stay well informed.

List, interview and map your stakeholders

Why? This will help you identify who you need to speak to in order to:
- draw from existing expertise
- make sure your challenge prize matches a specific need
- understand which stakeholders might play what roles
- prioritise who to speak to first.

Identify your stakeholders

Supplementing desk research with external engagement is a vital part of the scoping exercise. Drawing on the stakeholders you have come across in your desk research, identify around five key individuals to invite for interviews, as a starting point. It is likely that those initial stakeholders will provide you with more contacts to speak to. We recommend interviewing stakeholders in parallel to conducting a literature review.

Questions that might help you to identify key stakeholders are:

- Who are the people affected by the problem?
- Who are the people already doing work on the topic/problem?
- Who are the people and organisations who might respond to the challenge?
- Who might have relevant data?
- Who are the decision makers?
- Who are the policy makers and regulators involved?
- Which civil society organisations or funders might get involved?

Once you have your initial list of stakeholders, make sure you understand their potential interest and capacity to take an active role in the challenge. Identify two groups of stakeholders:

- Group 1: those that can help you understand the problem area (healthcare providers, data aggregators, patients, patient groups, support groups and organisations, public bodies, non-governmental organisations).
- Group 2: those that might be involved in the challenge (data scientists, clinicians, policy makers, social scientists, behaviour change experts, communicators, potential funders and partners).

Ensure you are speaking to representatives from both groups of stakeholders. Focusing on one group over another might lead to poor problem definition or a challenge design that does not support innovators.

Define a set of questions

For Group 1, questions might include:

- How would you describe the problem in this specific country or area?
- Have there been or are there ongoing initiatives related to solving this problem?

For Group 2, questions might include:

- Would there be appetite from a community to take part in such a challenge?
- What barriers might prevent you from participating?
- What kind of role do you see yourself/your organisation playing in the challenge?
- Could some people in your team/organisation set aside some time to help?
- *If relevant* - what kind of data produced by your organisation could be used for the challenge?

May 2020

You can also use some additional suggestions in Annex 3 (potential interview guide questions).

Run interviews and snowball through additional interviews

The aim of these interviews is to verify, challenge, refine and expand on the information you have drawn together through desk research or direct further research. Use the material you have already gathered as a prompt to ask for more detail, to fill in gaps and to hear alternative perspectives. The idea is to ask others for suggestions for datasets, suggestions of other stakeholders to engage with, and to help identify regulatory barriers. The interviews can be conducted online, over the phone or face to face.

It is useful to use a standard set of questions (an interview guide) so you can compare responses more effectively and ensure that the same general areas of information are collected from each interviewee; this provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting information from the interviewee.

> *Tip: Plan ahead*
> *Looking ahead, you'll need to invite several key actors for interviews and workshops. These can take time to arrange. For a workshop we recommend giving invitees three weeks notice. Therefore, set a date for your workshop and time slots for interviews early on. As soon as you come across key figures, consider getting in touch to organise an interview or invite them to a workshop. If you are working in a new region, we would also recommend working with local partners to help with engagement and organisation.*

Create an ecosystem map

Once you've started to engage with your stakeholders, we recommend you create a data ecosystem map. A data ecosystem consists of the organisations, communities and people that create and benefit from the value created by the data flowing through our data infrastructure. A data ecosystem map illustrates the value exchanges in an ecosystem.

This can be used both as a practical planning tool to manage your data ecosystem, and for communication and advocacy to demonstrate the opportunities for increasing value to particular parts of the ecosystem.

Place your challenge prize in the centre of your ecosystem. Draw on your list of stakeholders, the legal and regulatory review and the data inventory to identify and draw connections between the actors. Map the relationships and flows of value exchanged between them. This will help you identify roles, existing capacity and potential funding solutions.

1) **Map the data**
   Start by mapping the data stewards that you think are most relevant to your challenge. Then add in the specific types of data they hold. Consider the following for each type of data held by the data steward:

   - Is data at a patient level or at an aggregated level?

- What are the data access mechanisms required for that data?
- Are there data intermediaries who facilitate that access?
- Are there technologies used by data stewards that are relevant to the challenge?

2) Add your participants

Who is going to take part in the challenge prize? Are they startups, researchers, medical service providers, pharmaceutical companies, academic organisations, patient groups etc? Make sure you include those who will be involved in the prize even if they're not directly competing, such as individuals and organisations providing mentorship and judging.

3) Add your beneficiaries and think through the value chain

Who will benefit from the outputs produced through the prize? There may be several groups of beneficiaries. Think through the relationships between the beneficiaries and the order in which the different groups might gain value from the outputs of your challenge. For example, the outcomes of a challenge that primarily aims to enable better predictions of outbreaks and epidemics is likely to initially benefit global health organisations such as the WHO or aid organisations, who will be able to better target their efforts, which will in turn benefit patients and the public.

4) Add any other organisations such as funders and regulators

Are there any existing/potential funders in this challenge topic? Review your list of regulatory and statutory bodies. Which ones are most relevant to your challenge? Add them to the map and think though how you will need to work with them on the challenge

5) Sensitivities and blockers

Consider what might be the most sensitive relationships related to the topic and the conditions which could put those subject to the sensitivities at risk, for example insurance providers, local communities and different types of 'personal relationships'. Sensitivities will be different depending on the topic you are working on and the community you are working with. An example might be the relationship between carers and people with disabilities.

6) Opportunities

What role is your challenge prize playing in this ecosystem? What does the ecosystem map show you about the considerations you need to build into the prize so it has the greatest impact? Consider mapping the tools that may be created that provide services from the challenge participants to the beneficiaries.

Following is an example ecosystem map for a challenge project around reducing snakebite mortality and morbidity in India:

Develop your theory of change and evaluation structure

What? A theory of change is a tool that helps you better understand the complexity of the change you wish to see and imagine solutions. Through the creation of a theory of change you can:

-   plan specific strategies to solve a problem
-   gather evidence of success and failure
-   demonstrate contribution to impact.

Why? A theory of change is key to help structure your thinking throughout the scoping and design process.

Output: A theory of change table or diagram

Creating a theory of change will help you describe the problem you are trying to solve, and illustrate how and why the challenge prize is expected to bring about the desired change in the given context.

A theory of change creation exercise, such as the one described in Nesta's DIY Learn Module, can help you to articulate the impact you expect to achieve through addressing a specific health challenge, and how that impact will be achieved through the planned challenge prize activities, outputs and outcomes – the intended pathway to change.

According to Ideas to Impact – an action-research programme designing, implementing and testing innovation prizes to induce innovative solutions to development challenges in climate change adaptation, energy access and water, sanitation and hygiene (WASH) – a theory of change "enables prize teams to articulate assumptions and risks, to navigate the complexity that accompanies innovation prizes, and to inform decisions during launch and implementation".

May 2020

It helps to describe the steps by which you plan to achieve your goal, and the risks and assumptions – opinions or beliefs about how and why change happens – you're making with each of those steps. Throughout the implementation of the challenge, it will help you to see whether your work is contributing towards achieving the impact you want to have, and if there are other things that you need to consider as well.

If your challenge consists of a number of different streams with different outputs, a theory of change can help to plan the contributions of the individual streams towards the shared goals of the challenge.

It is important that your theory of change is designed through a collaborative and consultative process. This ensures that it is informed by a broad set of perspectives and that stakeholders are more engaged because they own the process and all the subsequent activities.

Tip: An iterative theory of change
You might want to prepare a draft theory of change as you start to get a clear understanding of the impact you'd like to achieve and how the challenge prize can facilitate that and share this draft with key stakeholders for their input. It should then be further refined through the scoping and design of the challenge.

Key components of a theory of change

1) **Overall goal/expected impact of a health data challenge prize**
   To define the overall goal, it might help to define the root cause and consequences of the problem or need identified, and the future you wish to bring about. For instance, you might design a challenge prize to reduce snakebite mortality and morbidity in a given country.

   Once you identify the expected impact, it is helpful to think about what needs to happen to make it a reality, ie what are potential solutions/ways to address the problem? This will help you define the medium-term effects of your work (outcomes), immediate, tangible effects (outputs), and the concrete steps to be carried out (activities), as listed below.

2) **Outcomes from a health data challenge prize**
   Following through the example of a challenge that aims to reduce mortality and morbidity due to snakebites, your expected outcomes might be around healthcare providers, policymakers and civil society making better informed decisions about prioritising preventive activities and resource allocation across healthcare facilities for snakebite response.

3) **Outputs from a health data challenge prize**
   Using this same example, the immediate, tangible outputs would likely be tools and applications that help different groups of stakeholders to make better decisions, for instance a web interface that allows health policymakers to see the anticipated effects of climate change on predicted snakebite instances and allows them to establish priority regions for snakebite management for the coming decade. Similarly, a web-based tool that helps hospitals estimate the right quantity of antivenom and intensive care units to order for the year ahead might be an output.

Another output of the challenge might be an engaged community of innovators who are better connected with academia and healthcare, and more likely to successfully work on solving health challenges.

4) **Activities of a health data challenge prize**
Some of your activities to run a challenge prize might include:

- Draft a call for proposals
- Promote the challenge prize
- Review applications and identify frontrunners
- Provide mentoring and support
- Support networking activities

Proposed template for a theory of change adapted from NESTA's DIY Tool on Theory of Change:

Who are the key stakeholders that will need to be involved? (Key stakeholders)	What steps are needed to bring about change? (Activities)	What are the immediate, tangible effects of your work? (Outputs)	What is the measurable effect of your work? (Outcomes)	What are the wider benefits of your work/ the long-term change you'd like to see? (Impact)
	Activity metrics	Output metrics	Outcome metrics	Impact metrics
	Key assumptions	Key assumptions	Key assumptions	Key assumptions

Assumptions are external factors not under the direct control of the challenge prize project which are necessary for the achievement of intended results.

Metrics or markers of success are the things you can measure to establish if the intended results are being achieved.

Think about measures of success
As you develop your theory of change, identify what your measures of success are. How will you know if the challenge has achieved the change you are aiming to make? What are the metrics of that change and how will you measure them? It is helpful to define metrics at all the different levels of your theory of change, ie for the activities, outputs, outcomes and impact.

Taking the previous example, an impact measure for the challenge around snakebite would be the mortality and morbidity rates due to snakebite. You would expect to see a drop in these numbers over time. Other measures that might be worth tracking would be the number of snakebites and snakebite envenoming cases.

An outcome measure for the same challenge could be the extent of the use of products and tools created during the challenge to inform decision makers about prioritising preventive activities and resourcing the health system for snakebite response. This could be tracked through several indicators, eg the number of health facilities that are actively

using the tools developed or plan to roll it out, or the number of NGOs that are validating or adjusting their community education activities as a result of using, for instance, interactive dashboards developed through the challenge.

Similar to how you identified the activities, outputs, outcomes and impact, you can refine the corresponding measures as you build up a better understanding of the change the challenge prize is likely to bring about.

Consider the risks
Consider the risks involved in running this challenge. For example:

- Are there risks which would prevent prize participants from getting involved?
- Are there any potential reputational risks attached to the challenge topic – data protection issues, political tensions, etc? Are there any macro PESTLE[1] factors that could hinder the challenge topic, or cause it to fail?

Set up a risk register. Example risks are included in appendix 3.

Review the legal, regulatory and policy context

Why? It will help you identify and understand the local context that impacts governance and the use of data in the region you are planning on running the challenge programme in. The key question you want to answer here is whether the policies and rules around the use of health data, and data more generally, are conducive to running a challenge prize.

This will also help you identify if and when you would need to engage with regulators, for example.

Output: Light review of the legal, regulatory and policy context of your topic area and region

It is important to start by developing a broad understanding of the legal, regulatory and policy context of the region you are looking to work on. For instance, a lack of clarity on privacy and data protection regulations can expose data holders to significant compliance risks and liabilities. Fragmented legal and regulatory frameworks also create uncertainty with the exchange of data across sectors and sovereign borders, should your challenge involve non-health data and/or run in multiple countries.

With a better understanding of the legal, regulatory and policy context, you should be in a position to make a decision about the feasibility of running a data challenge prize. The review should cover:

- Data protection laws and policies
    - the main privacy or data protection laws, policies and regulatory authorities that may impact on the access, use or sharing of personal data and/or anonymised data between different organisations
    - the privacy or data protection laws and regulations governing the access and exchange of data between third parties across sectors and/or across borders, including any relevant agreements required

---

[1] PESTLE: Political, economic, social, technical, legal, environmental
May 2020

- the material risks or liabilities data owners could be exposed to under the applicable laws for the sharing of data with third parties

- Intellectual property laws
  - whether any intellectual property legislation may be relevant to the use of data required for the challenge prize
  - the intellectual property legislation governing the ownership of any output and/or deliverables arising from the challenge prize
  - any requisite agreements and approaches to data licensing in the country you are looking to run the challenge prize in, including a short review of a selection and adoption of government open data licences

- Health data
  - any applicable laws, policies or regulations in the healthcare sector that may impact on the access, use or sharing of health data between third parties, including but not limited to susceptibility data and patient-specific data.

Make a data inventory

For more detailed guidance on this, see the ODI's guide on [How to create a data inventory](#)

Why? A data inventory exercise can help to identify the range of datasets that could be used for your challenge prize and where you need to engage with potential partners to gain access to them.

It will also help you identify datasets you would need to monitor and measure the impact of the challenge prize.

Output: A table with information on key datasets (see table template below)

'Data inventory' is a term the ODI has been using to help map out the key data and data-related resources that exist in a specific business sector or domain, or addressing a problem. These include datasets, data publishers, publishing outlets (eg the data.gov.uk website) and tools.

Tip: 'Good enough' data inventories
Depending on the size of the topic and the amount of data available, it might not be possible to create a full data inventory as part of the scoping phase. If this is the case, you could focus on creating a high-level data inventory in the short term and expand on this in the challenge set-up phase.

Some additional goals can be to:

- assess the quality of the data available
- have a robust analysis of the sector data
- easily access relevant data
- assess the range of data owners in the relevant sector
- make recommendations to improve open data practice in the sector.

To decide on which datasets to look into, you might want to consider:

- what kind of data you are looking for – using a [matrix of medical data](#) might help, to identify the types of health and non-health data you are looking for, and to prioritise your search
- country coverage
- how recent the publications and datasets are
- the credibility and reliability of the data source
- the methodological soundness of the data collection approach.

The information you are looking for needs to be data specific and can be captured in a [spreadsheet format here](#). You might want to look into the format(s) the data is in (MS Excel, CSV, JSON, SQL DB) and standard being used.

May 2020

Section three: Design your challenge prize

Now that you've spent some time identifying your problem and scoping it out in more detail, you should be in a good position to design a plan for how your challenge prize will run. Depending on your funding situation, you might need to put a proposition together as part of a bid.

This section describes some of the elements you'll need to work through in order to have a clear plan for how you'll deliver for your health data challenge prize. You can find an example delivery plan on pages 10-11 of the Nesta and ODI Open Data Challenge Series Handbook.

1) Set out your phases and sequencing

   Your challenge prize will need to be split into different phases. We have outlined some common phases in appendix one, but these may vary depending on the topic and problem you have selected and where you are running it in.

   If you are running a challenge prize that is looking to address more than one problem, we would recommend staggering the phases so they aren't all running at the same time. This will allow you to learn and adapt as you go.

2) Estimate your budget

   You'll need at least an estimate for how much the challenge prize programme will cost to deliver. You may have a set budget that you need to work within, or you may be pitching for funding.

   It is important to remember that you'll need budget for the running of the prize (for example project management, financial management, communications and branding, legal support) as well as budget for the prize itself. The budget should include money for the following aspects (depending on phases involved):

   - data acquisition, curation and access control
   - events, eg demo day, judging event and launch lab
   - seed funding
   - training and mentorship
   - communications
   - prize money.

3) Summarise your scoping work in a proposition

   We recommend that you summarise your scoping work into a proposition, which you may need to do anyway if you are pitching for funding. Even if you already have funding confirmed for your challenge prize, it is helpful to have everything collated in one place and it allows you to share it with others more easily. In your proposition, you should clearly articulate:

- why a challenge prize is the right approach for the problem in question
- what will be achieved through the challenge prize and how
- where the challenge prize should run
- who should be involved (participants, decision makers and delivery partners)
- the success indicators
- the phases and sequencing
- the budget
- how the programme will be governed and evaluated
- key decisions which need to be made before the prize can go ahead
- a risk register
- a communications strategy.

You can find out more about how to run a challenge prize in the 'Deliver' section of the Nesta Challenge Prizes Guide.

Appendix 1: Main phases of work in a challenge prize

This is a framework you can use to think about different phases within your challenge prize, but there are other approaches and delivery patterns which may be more appropriate. You can find out more about these in the [Nesta Challenge Prizes Guide](#).

Set up and recruitment

- Convene end-users and stakeholders across the communities in question, including local, state and national government and private sector, in order to verify their needs with regard to the topic
- Establish agreements with local delivery partners, and develop the detailed delivery plan.
- Establish agreements with data providers.
- All data will need to be vetted and cleaned thoroughly prior to launch in order to verify quality and limitations. This will take dedicated resources and be the most time consuming part. The aim is to ensure that participants can use the data as soon as they enter the model development phase.
- A website will need to be established with all the required information on the topic and processes. This should then be publicised to the target audiences. Expressions of interest (EOIs) can be open to those who have predefined ideas and projects, and those who may have relevant skills but no project proposal.

Launch and applications

- Organise a 'lab' or multi-day event and invite all those who have completed EOIs, along with beneficiaries, data providers and delivery partners.
  - The event should focus on why the challenge topic is so important, how the problem needs to be addressed and the processes involved in participating in the challenge prize. This should be recorded and sent to people who can't attend.
  - Participants should have the opportunity to share their project ideas, recruit new team members and engage with data providers and stakeholders.
- The teams should then be given a set period of time to confirm their teams and submit their area of interest/initial proposal in the formal application. This will then be assessed by the judging team based on predefined criteria.

Model development phase and demo day

- Teams should be encouraged to focus on engaging with the available data and modelling it to develop insights.
- They should receive some seed funding (if required), data access support to help them identify the specific datasets they need for their project and any governance requirements.
- Through the development of models and insights, the teams will be asked to put together plans for developing applications and tools, drawing on the data science methods and insights they have developed in this phase.
- Organise a demo day where participants can showcase the models and insights they have developed using the data and give their pitches for tool development. They should be judged by a panel of key stakeholders and experts in the field against a set of publicly accessible scoring criteria.

Tool development phase and prize

- The projects that have progressed from the model development phase will receive further seed funding (if required) to develop the tool or application outlined in the model development phase.
- Teams should have a greater focus on digital development, working with and drawing on the expertise of the scientific experts and stakeholders to inform their work.
- Teams should have an opportunity to implement their full or partial solutions in an environment with real stakeholders.
- Organise a public demo day and invite senior stakeholders and media representatives. Each of the teams should present their work and explain how they have used data science to address the problem. A set of judges should review the submissions and the most successful one be awarded a cash prize.

Sustainability

- A sustainability period should follow the award of the prize, in order to support the winning project and the other projects to be adopted by the key stakeholders and used to address the key issues. If possible, some additional funding should be made available for sustainability for the top three prize submissions.

Communications and evaluation

- Stories about the prize should be told through different media channels, and the impact and success should be evaluated.

Appendix 2: Examples of relevant data sets

In the matrix of medical data you will find some examples of datasets to be looking for.

Below you will find examples of how these datasets can be helpful in solving health-related issues such as access to healthcare, improving the quality of healthcare or preventing the spread of a disease.

Extending access to healthcare

- Citizens can locate and use the nearest healthcare providers using tools such as Farmacias de Turno Chile (Chile), MOH iHealth SG (Singapore), Health Facilities (Ghana) and Onde ser Atendido (Rio de Janeiro, Brazil).
- Citizens are able to make choices between healthcare providers based on quality, which may encourage the use of healthcare facilities, by using tools such as Temporada De Passes (Uruguay) and Find the Best Hospital (UK).
- Citizens are better able to understand illnesses and treatments, allowing them to make informed decisions about seeking appropriate medication and care, when using tools such as MedAfrica (Africa), InfoVacunas (Chile) and Iodine (USA).
- Medical practitioners are able to locate patients faster using the outputs of mapping projects such as Humanitarian Openstreetmap Team and MSF Missing Map Project.
- Citizens and policymakers can be made aware of forecasted and current extreme weather events, which may increase their ability to identify, plan and implement measures to mitigate the effects of these on health.
- Policymakers may identify and plan health care interventions and prevention measures using tools which relate levels and sources of pollution to incidences of disease and illness.

Improving the quality of healthcare provision

- Citizens are able to locate the most relevant healthcare provider and service, encouraging the efficient and effective use of healthcare resources, using tools such as Farmacias de Turno Chile (Chile), MOH iHealth SG (Singapore), Health Facilities (Ghana) and Onde ser Atendido (Rio de Janeiro, Brazil).
- Citizens are able to identify and challenge providers to increase the quality of healthcare provision using tools such as Temporada De Passes (Uruguay). Medical practitioners are able to provide efficient and effective care using easy-to-access medical and clinical reference information via tools such as Health eVillages (Worldwide) and AMREF mHealth (Africa).
- Citizens and policymakers are able to compare the level of investment and outcomes of regional healthcare systems, informing the future distribution of funds or the need for greater efficiency, using tools such as healthcare spending visualisations in Kenya.

Preventing the spread of disease

May 2020

- Citizens are able to better understand the spread of disease, the best preventive measures, symptoms and when to seek care using tools such as MedAfrica (Africa) and InfoVacunas (Chile).
- Responses to disease and illness from governmental, third sector and intergovernmental actors can be coordinated and targeted using platforms such as Healthmap (Worldwide) and Humanitarian Data Exchange (HDX) (Worldwide).
- Intergovernmental and non-governmental actors are able to respond more rapidly to outbreaks using the outputs of mapping projects such as Humanitarian Openstreetmap Team (Worldwide) and the MSF Missing Map Project (Worldwide).
- Researchers are able to develop computer models to better understand disease patterns, which can inform governments and third parties of where and how disease will spread, to improve resource allocation and preventative measures in projects such as QWeCI (Africa).

Appendix 3: Additional resources

Examples and resources for theories of change
Some key resources around theory of change creation include:

- Challenge programme or innovation prize specific resources:
    - NESTA's [DIY Learn Module](#) and [DIY Tool](#) on Theory of Change
- Other resources:
    - Keystone Accountability's guide to [Developing a Theory of Change](#)

Here is a sample theory of change for a challenge project around reducing snakebite mortality and morbidity in India:

Key stakeholders	Challenge prize activities	Outputs	Outcomes
Data scientists (tech community) Health community Patients General public	Build multidisciplinary partnerships with universities, NGOs and other relevant institutions in designing and running the challenge Identify and enable data access opportunities Promote the challenge and engage with challenge participants Provide seed funding Engage with 'end user' groups (patients/ clinicians/ healthcare providers/ researchers/ citizens) in order to inform/ co-produce the prize entries Judge entries and give prize Provide mentoring	Snakebite data innovation minimum viable products (MVPs) are developed that draw insights on the risk of snakebite, envenoming, and mortality and morbidity in order to develop products and tools that help: ● Hospitals and other healthcare providers better plan and manage the resources needed to respond to snakebite instances (antivenom and other supplies and equipment (eg intensive care facilities), trained clinicians, etc.) ● NGOs and other stakeholders better target snakebite prevention activities, e.g. community	Short-term: Clear plans and/or partnerships established to implement and/or sustain snakebite data innovations beyond the duration of the award Mid-term: Products and tools created during the challenge are used to inform decision-makers about prioritising preventive activities and resourcing the health system for snakebite response in Tamil Nadu

	Provide sustainability support for entrants Strengthen the community of data scientists working on the challenge and beyond through peer network support	education interventions ● Health policymakers carry out more informed long-term planning for snakebite management requirements in the region	
		Networks/relationships across tech, academia and healthcare are established or reinforced to improve the preparation and response to snakebite instances in a sustainable manner	**Impact** Snakebite mortality and morbidity is reduced in India
	Assumptions (external factors not under the direct control of the project which are necessary for the achievement of intended results)	**Assumptions**	**Assumptions**
	Key stakeholders such as the state department of health in Tamil Nadu shares data with us Challenge participants provide high-quality submissions	Hospitals and other healthcare providers, and policy-makers prioritise the implementation of efforts, such as the use of applications and tools developed through this challenge prize, to better plan for snakebite response	Snakebite data innovations are continuously reviewed and adapted to changing circumstances
	Stakeholders across tech, academia and healthcare are able to commit sufficient time to collaborate	There is enough interest in funding or maintaining the snakebite data innovations beyond the duration of the award	

May 2020

Potential interview guide questions

The following can be used as the basis for an interview guide. Use these questions as core prompts and add any other questions specific to the challenge, region or type of stakeholder you are interviewing:

Suggested questions for the interview guide:

- How open is the sector?
- Are there any challenges related to health data sharing in the sector/ country?
- Does your organisation hold health or health-related data?
- How is this data being accessed, used and shared?
- Who are the reusers of such datasets?
- Does your organisation rely on access to health data? If so, where and how do you access it?
- Are there already solutions to this challenge available that we haven't come across?
- Who else should we be speaking to?
- How do you interact with other organisations in the field on this topic? Do you share data?

Example risk table

Risk statement	Impact statement	Impact Range 1-5, 5 being highest impact	Likelihood Range 1-5, 5 being highest likelihood	Overall Impact x Likelihood = result for focus Max score = 25 10-20 = Amber 21-25 = Red	Mitigation
There will not be sufficient access to data	The participants of the challenge will not be able to develop appropriate solutions	5	?	?	The selected challenge must identify data stewards to partner with prior to launching the prize.
Data will be misused by participants	This would undermine the integrity of the prize and the development of public trust, limiting the impact of the	5	?	?	Ensure data monitoring of data use.

	prize and damaging reputations of those running the prize.				
Data will not be accessible by different members of a team who are in different countries	This would restrict the ability for remote teams to collaborate.	3			
IP issues are not addressed					
The prize does not deliver effective solutions					

Data ecosystem roles to consider when mapping:
Taken from [roles](#) in The ODI's Data Ecosystem Mapping methodology
- Data stewards: Who is responsible for collecting, managing or ensuring access to a dataset?
- Beneficiaries: People or organisations that benefit from the data ecosystem because it enables them to make decisions (such as practitioners, patients groups etc).
- Contributors: The people who contribute to the dataset, either knowingly or unknowingly through use of a service.
- Intermediaries: What services add value to a dataset? Are there groups that aggregate data in the ecosystem (such as charities)?
- Creators (or data users): Who uses the data to create things? These could be products, services, analyses, insights, stories or visualisations (such as innovators, academics, data scientists).
- Regulators: Those who create and enforce regulatory frameworks.
- Policymakers: Those who create policies, principles and measures.
- Reusers.
- End users.
- Capacity developers.
- Technology providers.