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PRECISION DRIVEN HEALTH

PROGRAMME EVALUATION AND FUTURE OPTIONS

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PREFACE

This report has been prepared for Precision Driven Health by EeMun Chen, Stephen Knuckey, Sharyn Jones, Doug Martin, and Marcus Pawson from MartinJenkins (Martin, Jenkins & Associates Limited).

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Cover image: Precision Driven Health

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SUMMARY

Precision Driven Health (PDH) is a collaboration aimed at improving the health of New Zealanders through the innovative use of data science in the health sector. An unincorporated joint venture between Orion Health, the Waitematā District Health Board, and the University of Auckland, PDH aims to increase data science capability in our health sector and encourage innovation in the use of health data.

PDH is funded by Orion Health and the Ministry of Business, Innovation and Employment (MBIE) in partnership. The funding began in 2016 and has been made available until March 2023.

This report by MartinJenkins presents our assessment of how PDH has progressed so far. It also sets out our proposed option for PDH's future form.

* What PDH has achieved so far

PDH has met many of its output targets and short- and medium-term outcomes

In a relatively short time, PDH has met, or is well on track to meet, many of its self-imposed output targets, and several of its intended short- and medium-term outcomes. These achievements include:

* actively supporting **105 projects** as of March 2022

* providing **51 research scholarships**

* funding and supporting projects undertaken by **50 researchers from academia, 97 from commercial settings, 50 students, and 67 from DHBs**. This includes **25 researchers of Māori descent**

* supporting the development of **10 products**, including the NZRisk Calculator and New Zealand Algorithm Hub

* increasing the **quantity and quality of health data research** in Aotearoa New Zealand and improving research capability. This has included raising the profile of health data science through PDH's research and public outreach events and fostering collaboration between individual researchers, clinicians, and entrepreneurs.

Organisational collaboration is a large and complex challenge and while PDH has fostered more collaboration between individuals this collaboration has not yet been achieved at an organisational level

PDH has strengthened relationships at the individual level, between individual researchers, clinicians, and entrepreneurs. However, it has had only limited ability to influence system-level change at Waitematā DHB, University of Auckland, and Orion Health, and so there has so far been only limited collaboration between these three organisations. Particularly apparent is the lack of collaboration to secure access to data science expertise.

PDH has not embedded its products and models into the public health system and achieved the related health benefits. This is understandable given the long lead-times needed for health savings to be realised. PDH also does not control the conditions that would improve the uptake of new products in the public health system.

PDH has faced difficulties in accessing DHB data, securing clinician time, and engaging with DHBs to identify health priorities where data solutions would have a strong impact. Another challenge has been a lack of systems and processes for trialling products.

Other health innovation initiatives in Aotearoa have faced those same challenges.

PDH's partnership model of working with Māori is a significant success story

Partnering with Māori and iwi was an area of future focus identified in a mid-term review of PDH. PDH has taken up this opportunity, and an emerging strength is the way it has developed relationships with Māori health providers.

Future partnerships could include a broader range of Māori social and health providers, and iwi/hapu.

Key opportunities

PDH should broaden its focus to include primary care and should prioritise projects that focus on public health

PDH has initially focussed on commercial projects rather than those involving the public health system. This has been understandable given the significant resources and funding that Orion Health has made available to many research projects and scholarships.

Most PDH projects have involved secondary care. Given this is where accessing data has been the most difficult, it would make sense for PDH to broaden its scope to include primary care. In Auckland alone, there are data-sharing

agreements among Auckland primary health organisations (PHOs) that would support this.

The health and disability system reforms also present an opportunity to embed health data science into the wider health system in a more integrated and structured way.

PDH's support could be re-aligned to further encourage partnerships with small and medium enterprises outside of Auckland

PDH has encountered some difficulties when trying to engage with industry and NGO partners:

* Some businesses have been reluctant to engage because they are concerned about potential competition and protecting their IP.

* Some smaller businesses and NGOs have struggled to meet the matched co-funding requirement for support.

* Partnerships and projects so far have been Auckland-centred, which is where the PDH foundation partners are based.

Many stakeholders noted that PDH and its successes would not have happened without the support of Orion Health, and it is clear that Orion Health will continue to be a critical partner. However, if the partnership is broadened to include more commercial and NGO partners,

including in other parts of New Zealand, this will help address the difficulties described above.

We discuss some other opportunities for PDH from page 16.

Future options for Precision Driven Health

OUR PROPOSED MODEL: AT A GLANCE

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A more developed Precision Driven Health with a broader range of partners and a role in embedding health data innovations into the public health system

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In our view the preferred option for PDH is to continue to develop the current PDH model by building up the number of industry, health, and research partners, with a particular focus on partnerships with public health institutions and on accelerating the take-up of health data innovations in the public health system.

Key considerations for developing our proposed model

In developing and assessing options for a future model for PDH, we considered how each model could:

* build on PDH's existing strengths and opportunities – for example, its ability to:

  » improve the quality and increase the amount of health data research

  » improve health data science capability, and

  » build up the portfolio of health data innovation products

* address the challenges PDH faces – for example, how it can support the development of institutional relationships, increase the number of commercial and NGO partners, and improve access to clinician and health data science expertise.

WHAT STAKEHOLDERS THOUGHT ABOUT FUTURE OPTIONS

Stakeholders believe a health data entity is needed

Most stakeholders agree that a health data entity like PDH is needed over the longer term in order to build capability in health data science and to

encourage innovation in New Zealand's health sector.

However, there is a tension between the twin goals of (i) commercialisation and internationalisation and (ii) improving public health care. We considered how to balance those two goals as part of our assessment of future options for PDH.

How stakeholders would like to see PDH evolve

Feedback received from stakeholders about how they would like to see PDH evolve included that it should:

* have stronger links to capability across New Zealand

* involve more private and NGO partners

* collaborate more closely with other health innovation initiatives, and

* involve a strategic partnership with the public health sector.

LESSONS FROM SIMILAR PARTNERSHIPS HERE AND OVERSEAS

We looked at lessons from similar models of digital health or health data innovation centres,

partnerships, or ecosystems overseas. The lessons included the need to:

* be supported by a combination of government investment in economic development and health portfolios

* have strong relationships with the public health system, and
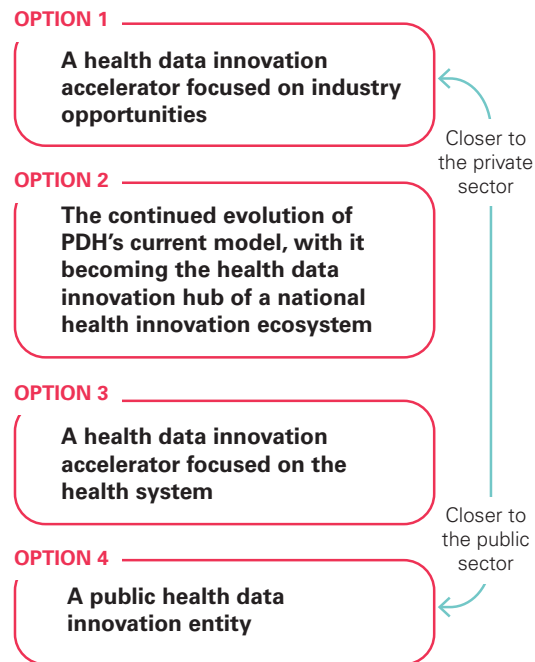
* be part of a joined-up health innovation ecosystem.

Lessons from models of industry-research partnerships in New Zealand, included the need to:

* maintain a strong focus on industry and/or public good, and

* be able to clearly demonstrate results and ensure consistency with government priorities.

The four options that our evaluation and our research pointed to

Based on our evaluation findings and on lessons from other models, we identified four potential options for PDH's future.

The options span models that are closer to the private sector to those that are closer to the public sector:

OPTION 1

A health data innovation accelerator focused on industry opportunities

Closer to the private sector

OPTION 2

The continued evolution of PDH's current model, with it becoming the health data innovation hub of a national health innovation ecosystem

OPTION 3

A health data innovation accelerator focused on the health system

Closer to the public sector

OPTION 4

A public health data innovation entity

The option we recommend

Our proposed option is to continue to evolve the current PDH model by building up the number of industry, health, and research partners, with a particular focus on partnerships with institutions in the public health system and on accelerating the take-up of health data innovations in the public health system. This takes the best of options 2 and 3.

This option will enable PDH to build on its current team and expertise, and continue to achieve industry and commercial benefits, while increasing its reach into the public health system and expanding its range of partners.

It will strengthen PDH's value proposition as the health data innovation interface between industry, the research community, and the public health system. PDH will support the development and implementation of health data innovations in order to expand the health tech sector and create better health solutions, rather than moving too far towards mainly private-sector or mainly public-sector objectives.

The proposed model is consistent with overseas models that focus on building capability and creating opportunities in health data innovation, as part of broader health innovation ecosystems.

Further detail on the features of this option is provided in this report from page 20.

More detailed recommendations on how PDH should continue to evolve

The following are recommendations to enable PDH to continue to evolve over the next 18 months:

1. Discuss and co-design with key stakeholders an improved model for PDH, building on its initial successes, its health data science strengths, and successful data and digital health innovation models from overseas. Emphasis should be on increasing the number of partners and accelerating the take-up of health data innovation in the public health system.

2. Publicise the positive contributions that PDH has made to:
   a. New Zealand's health IT companies, including Orion Health and its current partners
   b. New Zealand's health sector, including Waitematā DHB, the Ministry of Health, and others
   c. Māori health providers
   d. Innovation in health data science.

3. Engage with those leading the Health NZ and Māori Health Authority process to get an understanding of the relative importance of health data innovation in the reform process and how PDH can best be positioned in relation to the reforms.

4. Engage with MBIE and Callaghan Innovation, and the Digital Technologies Industry Transformation Plan, to better communicate the value of PDH in:
   a. increasing the level of health data R&D being funded by industry
   b. supporting the commercialisation of health data innovations.

5. Engage with New Zealand health IT companies to confirm the demand for, and preferred arrangements for, R&D incentives provided through the PDH model.

6. Develop and commit to a programme of activity with i3 (Institute for Innovation and Improvement) in Waitematā DHB to identify, test, and develop a small selection of data innovations that are focussed on priority health problems and that can be addressed by health data analytics. This should include identifying solutions to challenges that have arisen within the partnership to date, and ways of co-locating expertise at the DHB.

7. Explore opportunities to partner with key organisations in the health sector, including:
   a. New Zealand Health Innovation Hub (NZHIH)
   b. Te Tītoki Mataora (the MedTech Translator)
   c. Te Pūnaha Matini and KiwiNet
   d. a primary health organisation, such as ProCare Health
   e. the Māori Health Authority
   f. industry bodies such as New Zealand Health IT (NZHIT), Health Informatics New Zealand (HiNZ), and the Medical Technology Association of New Zealand (MTANZ).

The Health NZ reform process noted above provides a significant opportunity to use health data innovation to improve health outcomes in New Zealand. Key decisions on the reform process are still to be made, and in the meantime these recommendations are designed to enable PDH to demonstrate how health data innovation could be best supported under a new system.

Additional recommendations are provided in this report about smaller improvements for PDH's operations, including publishing guidance to support the development of the sector and broadening the role of the governance board.

INTRODUCTION

What Precision Driven Health does and what it's trying to achieve

Precision Driven Health (PDH) is a collaboration aimed at improving the health of New Zealanders through the innovative use of data science in the health sector. An unincorporated joint venture between Orion Health, the Waitematā District Health Board (DHB), and the University of Auckland (UoA), PDH aims to increase data science capability in New Zealand's health sector and encourage innovation in the use of health data.

Key things that PDH does

* PDH invests in research, through on-demand and contestable funding mechanisms.

* It helps develop the health data-science workforce through providing scholarships.

* It facilitates research partnerships between commercial organisations, the healthcare sector, Māori and iwi organisations, and academics.

* It provides expert advice and peer review, and supports researchers and organisations

to carry out ethical research with appropriate protocols for data use.

* It provides research projects with expertise and services in innovation, project management, and contract management, and it helps form and source appropriate teams, projects, and project resources.

Over the long term, these investments should be sustainable and provide a return on investment.

How PDH is funded

PDH is funded through a partnership with Orion Health and the Ministry of Business, Innovation and Employment (MBIE), as part of MBIE's Partnership Scheme:

* MBIE is providing $14 million over seven years through the Partnerships Scheme

* Orion Health is providing $14 million over seven years

* Waitematā DHB is providing $1.4 million over seven years, and

* commercial partners are providing another $7 million.

In total, the partnership is investing around $38 million over seven years. Funding has been made available until March 2023.

About the Partnerships Scheme

The Partnerships Scheme strengthens ties between research organisations and research users, particularly industry users, by supporting them to establish a long-term research programme. Partnership members decide the research they will do, so that it is driven by the needs of the particular industry or sector.

Other partnerships funded through this scheme have mostly been in the primary sector. PDH, the Malaghan Institute of Medical Research, and the University of Canterbury[1] are the only three non-primary sector research partnerships out of a total of 30 funded partnerships.

The landscape of health data science in New Zealand

Business innovation requires actors to work together

In order for businesses to innovate, innovation actors need to collaborate. There are low levels of collaboration between business and academia

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1   For 'Infrastructure Systems Engineered for Improved Value and Resilience'

in New Zealand.[2] In the health data science[3] sector, health system providers, academics, and businesses do not all regularly work together.

Despite the country's small size, New Zealand has produced a number of globally successful health software and tech firms. There is an opportunity to work with these internationalised businesses, and with those who are up and coming, to support them to be providers for New Zealand's health system and to further contribute to New Zealand's exports.

Innovation in our health system

The New Zealand health system has a number of strategic priorities that are informed by the Health Research Strategy (2017), the Industry Policy (2019), and the Digital Health Strategic Framework (2019). These inform innovators about the strategic direction of the public health system in the medium term (three to five years):

* Innovation is (to be) shared and adopted across health organisations to improve

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2 OECD. (2017). OECD science, technology and industry scoreboard 2017: The digital transformation. https://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2017_9789264268821-en

3 The health data science sector can also be referred to as "machine learning in health", "algorithms in health", and "data and intelligence for health decision making".

the sustainability of the system, reducing duplication.

* Innovation is (and will be) seen as a key method to improve equity and health outcomes for New Zealanders.

* Hira (the national health information platform) is intended to provide opportunities for innovation.

* There is growing and ongoing investment for innovation.

* There is growing capability and capacity for innovation.

* New Zealanders and the New Zealand economy should benefit from the commercial value of innovation.

* Innovators should consider the participation and leadership of Māori in their approach to health technology innovation.

On 21 April 2021, the Government confirmed the details of the health system reforms in response to the Health and Disability System Review. The key changes are:

* The Ministry of Health will be focussed on policy, strategy, and regulation.

* A new body, Health NZ, will take over the planning and commissioning of services and

the functions of the existing 20 District Health Boards to remove duplication and provide true national planning.

* A Māori Health Authority will work alongside Health NZ to improve services and achieve equitable health outcomes for Māori.

As of March 2022, it is unclear how health data science will be incorporated into this new health system.

There are many different organisations, providers, and stakeholders in the health data science innovation system (Figure 1). This system can be difficult to navigate and there are weak linkages within and between all parties. Note that there are no support organisations with "health data science" at their core. It is usually a capability that sits within a health software or tech firm.
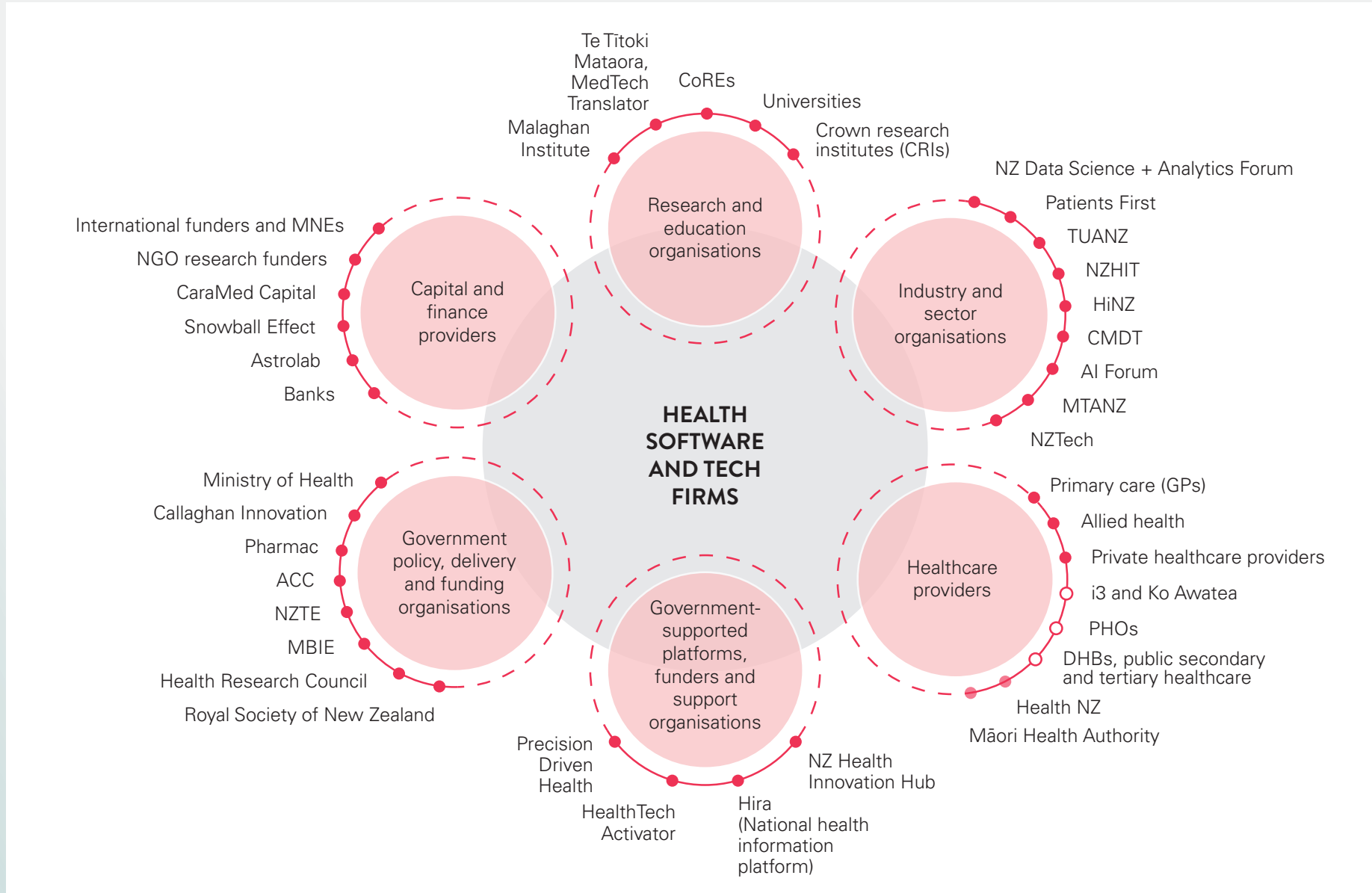
What the assessment in this report is based on

Our assessment and recommendations are based on:

* document review and review of international and national models of health data initiatives

* data analysis and data visualisation

* interviews with 32 individuals

* workshops with representatives from PDH, MBIE, the Ministry of Health and industry.

FIGURE 1: HEALTH DATA SCIENCE INNOVATION SYSTEM

Te Tītoki Mataora, MedTech Translator
Malaghan Institute
CoREs
Universities
Crown research institutes (CRIs)

Research and education organisations

NZ Data Science + Analytics Forum
Patients First
TUANZ
NZHIT
HiNZ
CMDT
AI Forum
MTANZ
NZTech

Industry and sector organisations

International funders and MNEs
NGO research funders
CaraMed Capital
Snowball Effect
Astrolab
Banks

Capital and finance providers

HEALTH SOFTWARE AND TECH FIRMS

Ministry of Health
Callaghan Innovation
Pharmac
ACC
NZTE
MBIE
Health Research Council
Royal Society of New Zealand

Government policy, delivery and funding organisations

Primary care (GPs)
Allied health
Private healthcare providers
i3 and Ko Awatea
PHOs
DHBs, public secondary and tertiary healthcare
Health NZ
Māori Health Authority

Healthcare providers

Precision Driven Health
HealthTech Activator
Hira (National health information platform)
NZ Health Innovation Hub

Government-supported platforms, funders and support organisations

PROGRESS SO FAR

PDH has led to more health data science research, improved research capability, and high-quality research

PDH works in partnership with industry players to co-fund and support health data science research projects. As at March 2022, excluding Orion Health, PDH had worked with 10 co-funding partners, with Vensa Health contributing over $2.8 million across 7 projects.

PDH has also:

* distributed over $1 million in scholarships and internships, over 51 projects.

* co-funded 10 products that are currently in production. This includes nzRisk calculator (www.nzrisk.com), a Data Imputation Guide, and the New Zealand Algorithm Hub.

PDH has raised the profile of health data science through its research and public outreach events

This includes:

* contributing to Health Informatics conferences and events with both HiNZ and NZHIT

* several public events including the University of Auckland Īhaka Lecture, and hosting a monthly Data Science in Healthcare webinar in collaboration with Orion Health

* contributing to New Zealand Data Science and Analytics Forum events.

PDH has won a number of national research and industry awards

These are testament to the quantity and quality of research PDH is generating. These include:

* 2021: Finalists, New Zealand IT Professional of the Year in four categories including overall, young achiever and digital health.

* 2020: Winner, Prime Minister's Science Prize as part of Te Pūnaha Matatini COVID-19 response modelling team (six PDH members named).

* 2020: Winner, Best Hi-Tech Solution for the Public Good Award at NZ Hi-tech awards.

* 2017: Winner, KiwiNet Research & Business Partnership Award.

PDH has the support of key stakeholders

Most agree that some form of entity is required for health data science in New Zealand. There is less agreement about what this might look like. This is further explored in the "Future options" section from page 17.

The twin goals of:

* commercialisation and internationalisation, and

* improving the way the health system functions and the health of New Zealanders

have been a source of tension for PDH, and this has at times been a barrier to achieving outputs and outcomes.

Despite this, PDH has delivered benefits against both goals, and will continue to do so over time. It is unrealistic to expect significant gains in commercial returns and dollar value health benefits in the relatively short time PDH has been operating.

PDH has fostered collaboration between individual researchers, clinicians, and entrepreneurs

PDH-funded researchers are spread across the health, business, and tertiary education sectors. By pulling different teams together from different types of organisations, and extensive use of

Orion Health data scientists working with DHB clinicians and academics, PDH has improved linkages and partnerships at the individual level.

PDH has widened the individual research networks that clinicians, academics, and entrepreneurs have. Researchers said that without PDH, they would not have known whom to approach to help them with their idea or product. Some said they were now more aware of how industry approaches R&D.

In many cases where PDH funding has ended, individuals have continued to work with researchers who were contracted through PDH, either on other projects or on the next phase of the same project.

> **"**
>
> "[W]hat will always be enduring is the relationship, the fact that PDH spent the time to walk side-by-side and hold the hand of [a Māori health and social services provider]. As an example, it's a really strong indicator that it's going to be a good relationship and that actually counts for a lot in the Māori health space."
>
> … "That counts for a heck of a lot … That sort of phase took about six months longer than it should have … in technical terms … but in relationship terms, it took exactly as long as it needed to. And like I said, that is so much more enduring than any sort of output or commercial outcome, really …"
>
> … "I don't know how well they [integrate equity and Māori health] on other projects. But I know … it's important when it's on the first page of the document. PDH are wanting to push this and they expect that every project will have some sort of accountability and if it's Māori health or partnering with Māori organisations, Māori capability that's all really core stuff that PDH wants."
>
> – Māori/NGO Health Provider

In a relatively short time, PDH has empowered New Zealanders and whānau to look after and make decisions about their own health, and it will continue to empower them

The co-funding of public-facing models and products and the way PDH has worked with commercial and NGO partners has provided early indications that New Zealanders and whānau are better able to make decisions related to their own health.

Recent partnerships with Māori health providers have been successful

Māori health providers and Māori data scientists who we interviewed emphasised that PDH's approach to partnership appeared to adhere to the principles of Te Tiriti o Waitangi. They spoke of it being a partnership that valued building relationships and rapport, and that equity and improvements to Māori health were important concerns for PDH.

These success stories and resulting research projects, outputs, and products all need to be better articulated – for funders, and the public. Documenting these case studies also means that others can learn from and replicate good practices.

PDH could place greater focus on primary healthcare to make more impact on health equity and empowering everyday New Zealanders

> " "It is definitely useful for the students, I would say. And some of those students would have later on decided to go on to doing research in this particular area … and one of my students was hired [by Orion Health]."
>
> – Academic

Because Orion Heath does not have market share in primary care, PDH projects tend to be focussed on DHBs and DHB data. A number of stakeholders commented that primary care is currently a "missed opportunity" for PDH.

We recommend reviewing the terms of reference of the Independent Advisory Group (IAG). IAG recommends the research portfolio and projects for investment to the PDH Board. IAG members could be expected to be champions of PDH and help generate research projects among their networks, including in primary care. Again, capacity constraints and a lack of prioritisation of PDH projects mean that there has been little engagement from, and with, primary care providers.

> " "I think it's the hospital managers that you need to engage with data science. Then they can champion and ring fence clinicians' time to take part in a project."
>
> – IAG member

All interviewees believed PDH has improved workforce capacity and capability

The most evident increase in workforce capacity and capability due to PDH is the funding of scholarships and summer interns, and increased access to PDH's broader networks. This has meant that there are now more health data scientists entering the system than before.

Orion Health has benefited the most from the scholarships, with much of its research team supported through that mechanism. Importantly, Orion Health also funded the bulk of scholarships.

Creating and embedding processes within hospitals to allow time for clinicians to be involved and providing clinician-researcher pathways would make the most difference in workforce capacity and capability.

> " "For us we had early churn with the people we brought on board, now we have a solid team [and] the right clinical team and we think differently now."
>
> – Commercial partner

PDH hasn't yet fully realised the contribution it could make to healthcare decision making, mainly because of difficulties in accessing data and its limited ability to influence DHBs' adoption of products and models

A key objective of PDH was to ensure that health care decision-making is informed by health data science. The main stumbling block to achieving

this was the unfulfilled expectation that the partnership with Waitematā DHB would lead to:

* easier or supported access to DHB data, and

* clear systems and processes for testing, validation and ultimately adoption of PDH funded products and models in the DHB environment.

> " "If there's no data, there's no data science."
>
> – Clinician

PDH has developed a framework for health data science research

In the absence of pre-existing collaborations in health data science in New Zealand, PDH has developed a framework for health data science research projects and contributes to the overall landscape of health data science in New Zealand.

PDH has contributed a governance model for the assessment and implementation of algorithms for use in the New Zealand health system, as deployed for the NZ Algorithm Hub.

PDH has played a leadership role in health data science in New Zealand

PDH has filled the gap in leadership in relation to health data science in New Zealand. Examples of this sector leadership include:

* submissions on health reforms

* publication of a report, Artificial Intelligence for Health in New Zealand

* representation on the Board of HiNZ and Digital Council for Aotearoa New Zealand

* leadership of the NZ Data Science + Analytics Forum

* a governance model for the NZ Algorithm Hub.

KEY OPPORTUNITIES

PDH should broaden its scope to include primary care

The majority of PDH projects have involved secondary care. However, that is the area where data access has been the most difficult, and therefore it would make sense for PDH to broaden its scope to include primary care.

In Auckland alone, there are data-sharing agreements in place among Auckland PHOs, and some PHOs appear to be open to working with PDH.

PDH could formalise and expand its university scholarships, including beyond Auckland

PDH scholarships have been a key contributor to building workforce capability in the field of health data science. This approach could be further formalised and integrated into the university environment, and across different schools and universities other than the University of Auckland.

There is also the opportunity to stimulate more capability among Māori data scientists.

PDH could partner with a broader range of Māori providers and iwi/hapu

An emerging strength of PDH is the way it partners with Māori health providers. This model could be replicated to partner with a broader range of Māori social and health providers and iwi/hapu.

PDH should consider how it could partner with smaller firms and NGOs

Organisations that have limited cashflow, typically smaller firms and NGOs, are unable to partner with PDH because of how the co-funding arrangements are structured. PDH should consider what alternative mechanisms it could provide to widen its potential partner pool.

PDH could do better at articulating its performance story

Although PDH has achieved much in a relatively short time, it could do better at highlighting its achievements and articulating them in a clear, concise, and compelling way.

A strategic approach to research projects and granting co-funding could enable PDH to contribute more to improving health outcomes

The projects that PDH funds are mostly determined and driven by the professional interests of researchers, rather than answering key questions for health and New Zealand's health system. By supporting work on those strategic questions by applying smart data science analytics, PDH would also be able to articulate and showcase the broader benefits of health data science.

PDH should continue to involve itself in the health and disability system reforms

The health and disability system reforms present an opportunity to embed health data science in new and different ways. PDH should continue to be present at policy and operational discussions and as the Transition Unit progresses its work.

FUTURE OPTIONS

Our proposed option: At a glance

A more developed PDH, with a broader range of partners and a role in embedding health data innovations into the public health system

In our view the preferred option is to continue to develop the current PDH model by:

* building up the number of industry, health, and research partners, and

* focussing on health system partnerships and on accelerating the take-up of health data innovations into the health system.

How we arrived at our proposed model

In developing and assessing options for a future model for PDH, we considered:

* how a model could build on PDH's existing strengths and opportunities, while addressing the challenges it faces

* feedback from stakeholders about PDH's future

* lessons from similar overseas models of digital health or health data innovation centres, partnerships, or ecosystems

* lessons from models of industry-research partnerships in New Zealand.

What stakeholders thought about future options

Stakeholders agreed that PDH should continue, with a broader range of partners

Most stakeholders we interviewed thought that PDH's health data capability and role should continue in some form after the current funding partnership ends.

However, stakeholders wanted to see the future PDH:

* have stronger links to capability right across New Zealand, and not just focus on Auckland

* be less dependent on Orion Health or on involving more private partners (although many noted that Orion Health's initial leadership was needed to get PDH off the ground), and have a greater focus on industry good activities

* potentially be closer to the public sector to reflect the public good nature of the co-investment from government.

When considering options, stakeholders suggested a future model should:

* be at the proof of concept/development end of the R&D pipeline (supporting a combination of commercialisation of health data innovation and take-up in the health system), rather than the discovery and research end

* have closer collaboration with other related initiatives (such as NZHIH, HealthTech Activator, Te Tītoki Mataora, the MedTech Translator)

* be able to facilitate access to a range of investment and revenue options (for example, competitive funding, equity, fees for services

"[To be successful] … industry … need to see it as more inclusive. And I think the health system … needs to be able to engage strategically with it."

— IAG member

– noting the feedback that funding for R&D isn't accessible to all organisations)

*   involve a strategic partnership with the health sector.

Lessons from overseas models

Overseas models suggest that PDH should be part of a broader health innovation ecosystem, with government health and economic investment

A review of offshore examples revealed that PDH is quite unique compared to health innovation and commercialisation models overseas. Many are broader in scope and cover the spectrum of innovations related to digital health, medical devices, therapeutics, service improvements, and so on. Examples include Health Innovation Hub Ireland, Health Innovation Network South London, Hong Kong Heathtech Innovation Center, and Heath Tech Hub Copenhagen.

Overseas centres or hubs that are focussed on digital health or health data are generally targeted at:

*   improving access to health data – for example, HDR UK, Michigan Center for Precision Health & Data Science, and Digital Health CRC Australia

*   improving health system take-up of digital health innovations – for example, DigitalHealth.London and the Canadian Personalised Healthcare Innovation Network

*   research, tech transfer and piloting and tied to universities or hospitals – for example, Institute for Precision Health (Notre Dame), Centre for Digital Transformation of Health (Melbourne), Brigham Digital Innovation Hub (Boston), Stanford Medicine Center for Digital Health (California), and the Digital Health & Care Innovation Centre (Glasgow)

*   providing broad support for digital health businesses to help them commercialise concepts – for example, ANDHealth (Australia) and Barcelona Health Hub.

Models that are more closely aligned with PDH's current model are:

*   Precision Medicine Scotland – Innovation Centre (PMS-IC) and Ecosystem (PME) – PMS-IC involves a consortium of four NHS Health Boards, four Universities and two industrial partners focussed on linking expertise with health data assets and delivery capability to develop new products and services. PME brings together healthcare, life sciences, academia, and industry to

collaborate to deliver precision medicine initiatives more effectively.

*   Precision Health Research Singapore (PRECISE) – a business unit under the Consortium for Clinical Research and Innovation focussed on implementing Singapore's 10-year National Precision Medicine Strategy. It combines genetic research, piloting of precision medicine in clinical practice, support for new enterprises, and attracting and anchoring overseas companies in relevant fields.

*   DigiHealth Hub Oulu (Finland) – The Hub supports digital transformation in the health sector by providing access to the latest knowledge, scientific expertise, technology and entry to innovation ecosystems and multi-partner cooperation (regional, national, international). It focuses on health data practices and competences in analytics for data-driven health innovation and the deployment of digital health services (such as mHealth, Artificial Intelligence). The Hub is part of the broader OuluHealth ecosystem.

Despite the variety of approaches, our review suggests that digital and health data innovation models offshore are increasingly sharing common elements:

* They are supported through a combination of economic and health investment.

* They have strong relationships with the health system, and are often part of national strategies to make better use of health data, including making the data more widely available.

* They are often one component of a broader, joined-up health innovation ecosystem.

* They facilitate access to a range of support mechanisms rather than providing all support themselves – funding, collaborative spaces, dataset services, consultancy, guides, access to investment, and so on.

Lessons from models in Aotearoa

New Zealand models with a strong focus on industry and/or public good are more sustainable

Although local models operate in different sectors and fields, other partnership-based innovation centres and networks in New Zealand can also provide lessons to inform decisions about PDH's future.

We reviewed the performance and operating arrangements across:

* industry-based R&D and commercialisation models – for example, Bioresource Processing Alliance, Bragato Research Institute, Cawthron, and the Meat Industry Research and Innovation Fund. Some of these had been mentioned as examples by stakeholders we interviewed.

* health innovation models – for example, NZHIH, what was the MedTech CoRE, HealthTech Activator, Ko Awatea, i3, and the National Institute for Health Innovation.
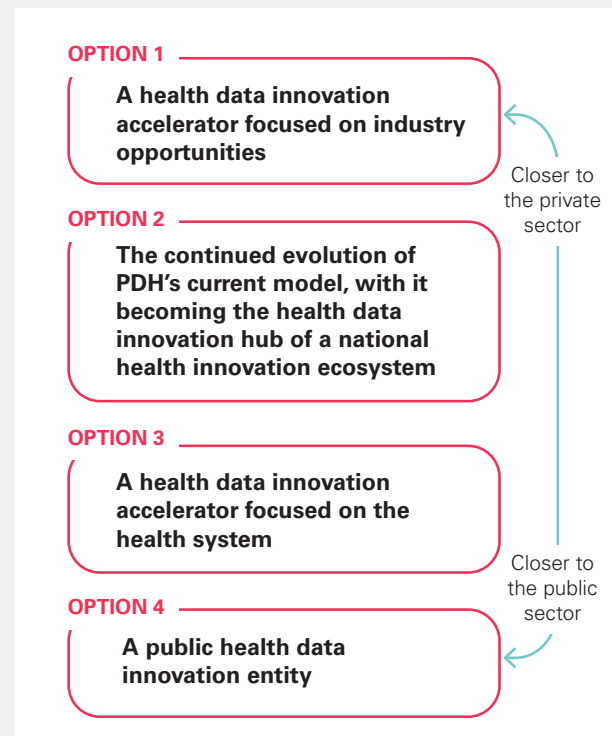
Our review of these models suggests that the following elements are important for longevity and for private- and public-sector investment:

* a strong focus on industry and/or public good, and effective collaboration with other parts of the sectoral or public innovation system.

* diversity in the leadership of the model and the interests involved in establishing and resourcing the model.

* being able to demonstrate results (and that these are clearly beyond what would otherwise have been achieved).

* clear consistency with government priorities.

Four options for PDH's future

We identified four potential options for PDH's future based on our evaluation findings and on lessons from other models.

The four options span from models that are closer to the private sector to those that are closer to the public sector:

OPTION 1
A health data innovation accelerator focused on industry opportunities

Closer to the private sector

OPTION 2
The continued evolution of PDH's current model, with it becoming the health data innovation hub of a national health innovation ecosystem

OPTION 3
A health data innovation accelerator focused on the health system

Closer to the public sector

OPTION 4
A public health data innovation entity

A description of the potential scope, roles, functions, and value proposition associated with each option is provided in the Appendix (see page 22).

Our proposed option:

....

A more developed PDH with a broader range of partners and a role in embedding health data innovations into the public health system

....

In our view the best option is to continue to develop the current PDH model by building up the number of industry, health, and research partners, with a particular focus on health system partnerships and accelerating the take-up of health data innovations into the health system (that is, taking the best of options 2 and 3).

Below we describe the strategic partnerships, areas of focus, and key functions for this proposed option.

The details of this model would need to be co-designed with key stakeholders over the next 15 months.

Strategic partnerships

We propose that PDH have strategic partnerships with:

* 4–5 key commercial and NGO partners (with 10–20 other private or NGO clients emerging)

* 2–3 universities (for example Auckland or Canterbury)

* initially Waitematā DHB, Canterbury DHB, Southern DHB, and NZHIH, and also over time Health NZ and the Māori Health Authority for clinical expertise and access to the health system. As noted in the previous evaluation findings, the development of partnerships with PHOs should also be in the mix.

Areas of focus for PDH to support

PDH would focus on supporting these key areas:

* the development and commercialisation of health-data-based R&D and innovation into new products and services to reach international markets

* the testing, adoption, and dissemination of health data innovation developed by businesses and by clinicians within partner DHBs and ultimately Health NZ / Hauora Aotearoa, with a focus on innovations that will address health system priorities

* the development of, and access to, health data science capability.

Key functions

Our proposed model would include the following key functions:

* testing and validating health data concepts from partners through an effective R&D and commercialisation process

* connecting researchers, businesses, and clinicians to a range of R&D and product/ service development support mechanisms, including co-funding, data expertise, clinical expertise, commercial and market expertise, and reference sites

* facilitating access to partner DHBs, PHOs, and ultimately the wider health system

* supporting data de-identification to ensure privacy and accelerate R&D

* funding scholarships and fellowships for innovators from the private sector, research providers, and the health system to develop health data concepts into innovations that will meet key health system demands

* matched co-funding for R&D activities with industry and the health system, potentially through competitive calls for proposals.

Testing and advancing the proposed model

The design and evolution of this model could be tested and advanced through the following:

* **Discussions with those leading the Health NZ process** to understand the relative importance of health data innovation in the reform process and how PDH can be best positioned in relation to the reforms.

* **A committed programme of activity with i3 in Waitematā DHB** to identify, test, and develop two to three data innovations that are focused on priority health problems that can be addressed using health data analytics. This should include identifying solutions to address challenges the partnership has faced so far, including:

  » data access

  » identifying ways of securing or funding the time of clinicians involved

  » addressing ethics approval processes, and

  » data security, and co-locating teams.

* **Exploring opportunities to partner with key organisations** in the health sector, including co-location opportunities, such as:

  » NZHIH – with a view to supporting the development of health data innovation concepts identified by the NZHIH and Canterbury DHB through PDH processes (noting that NZHIH may be integrated into Health NZ in future)

  » Te Tītoki Mataora, the MedTech Translator – PDH could work with Te Tītoki Mataora to identify health data innovation projects that would be suitable for a combination of support through the contestable Research Acceleration Programme and PDH. This could help to address early-stage funding issues facing some innovators

  » Te Pūnaha Matini and KiwiNet – to identify how a broader CRI and university network partnership could be established over the long term

  » a PHO (such as ProCare Health) – to identify how PDH could develop and fund projects in primary care

  » the Māori Health Authority – to identify how PDH could support future Māori health priorities

  » industry bodies such as NZHIT, HiNZ and MTANZ.

The Health NZ reform process noted above provides a significant opportunity to use health data innovation to improve health outcomes in New Zealand. However, until decisions on the reform process are made, testing and advancing key partnerships will enable PDH to demonstrate how health data innovation could be best supported under a new system.

APPENDIX

Option 1.
Health data innovation accelerator for industry

SCOPE

Focused on innovation from commercial players (start-ups, SMEs, larger businesses).

Strategic partnerships for expertise with a range of support providers.

Primarily focused on economic development outcomes.

KEY ROLE

Support the commercialisation of health data-based innovation into new products and services.

KEY FUNCTIONS

Testing and validating health data concepts from selected enterprises through a robust commercialisation process.

Facilitating business access to innovation and business development support, such as capability workshops, mentoring, investment etc, including through acceleration type programmes (for example, the research acceleration programme of the MedTech Translator).

Co-funding projects through competitive calls for proposals.

VALUE PROPOSITION

Commercial – development of new products and services and hence sales/revenue opportunities; improved access to market pathways; capability development; improved access to a large range of support services.

Health system – primarily to assist clinicians to develop commercial products. Any domestic health system benefits are a bonus.

Research providers – primarily to assist researchers to test and validate ideas and develop commercial products.

EXAMPLE OF OPTION 1: ANDHEALTH AUSTRALIA

ROLE

ANDHealth's mission is to support Australian digital health companies to navigate the commercialisation pathway from ideation to institutional investment and international market entry.

FUNCTIONS

It offers a range of programmes to start-ups, SMEs and high growth digital health businesses. These include:

» ANDHealth+ – funded by the Australian Federal Government, the programme supports up to 25 digital health SMEs across four intakes between 2021 and 2025. Each intake of 5-7 SMEs is selected through a competitive process informed by a cross-section of industry leaders with experience in evaluating and selecting high potential SMEs. The selected SMEs are supported by ANDHealth and industry advisors for 18 months to undertake activities such as clinical trials and commercial and clinical validation studies.

  • Each intake shares up to $3.75m of direct project funding and up to $3.5m of in-kind services from pre-vetted suppliers and experts dedicated to assisting the SMEs to undertake project activities. Participants also have access to their own advisory board with a track record in digital health product commercialisation.

  • ANDHealth does not require any transfer of equity from participants and does not assume any ownership or require any royalties from IP in the project.

  • Participants receive facilitated introductions to national nd international networks of investors, global healthcare and technology companies and specialised service providers.

» ACCELERATE Programme – this programme provides accelerator services for up to 30 participants per intake (entrepreneurs, service providers, clinicians, investors, and companies). It includes:

  • workshop-style learning groups

  • real-world case studies

  • advanced business concepts and strategies

  • expert guest speakers

  • networking opportunities.

» BRIGHT workshop – an interactive workshop designed to equip founders with practical skills and real-world insights into the innovation and commercialisation

process. The workshop is led by expert facilitators and speakers that have successfully built products and businesses into commercial success.

» BRIGHT Innovate – Designed for digital health companies with a business proof of concept, BRIGHT Innovate supports innovators to hear from, and work with, national and international industry leaders across a diverse range of topics to establish detailed feasibility plans.

» BRIGHT ideate – a series of sessions in which expert guest peakers cover topics such as voice of user/customer, regulatory pathways, IP, business models, evidence gathering, customer relationships and investment.

» ELEVATE Expert Coaching Programme – provides eligible companies with access to an international network of pre-vetted coaches to provide one-hour expert coaching sessions on areas of specific need. This can include business models, reimbursement, regulatory strategy, scale up manufacturing, clinical trials, design in health, voice of customer and voice of user, clinical trials, licensing and capital raising and others.

RESULTS

In 2020 ANDHealth achieved the following results:

» 196 companies attended BRIGHT programmes.

» 40 companies attended the Accelerate programme.

» The 10 ANDHealth+ companies reported $30.5m in capital raised, 188 jobs created, 33 clinical trials and studies commenced, 160 new customers, 17 new markets entered.

BACKGROUND

ANDHealth is a member-owned public company with a team of seven. It was established in 2017. Members provide financial contributions. They include Novartis, RMIT University, Roche, healthxl and Planet Innovation. Programme partners that supply expertise, services and funding support include MTP Connect, NSW Government, Government of Western Australia, lauchvic, Cicada Innovations.

Sources: From insights and annual reports available at https://www.andhealth.com.au/

Option 2.
Continued evolution of PDH's current model and becoming the health data hub of a national health innovation ecosystem

SCOPE	KEY ROLE	KEY FUNCTIONS	VALUE PROPOSITION
PDH evolves into supporting R&D and innovation from 4-5 key commercial and NGO partners, with a range of other private/NGO clients emerging.	Support the commercialisation of health data-based R&D and innovation into new products and services.	Testing and validating health data concepts from partners through a robust R&D and commercialisation process.	Commercial – development of new products and services and hence sales/revenue opportunities; subsidised R&D; improved access to academic and clinical expertise; potential access to skilled workforce (for the commercial partners involved); improved access to market pathways; joining health data enterprises with other expertise (for example, medical devices); and providing access to a greater range of support services.
Strategic partnerships for expertise with 2-3 universities.	Support access to health data and data science capability.	Facilitating access to expertise and peer review from clinical, scientific, commercial experts.	
Strategic partnership for expertise and access to the health system with MoH, Health NZ, the Māori Health Authority, NZHIH, HRC, and Callaghan Innovation.	Support the development of health data expertise.	Facilitating access to a range of support mechanisms – co-funding, data expertise, reference sites, and consultancy, provided by the other partners in the ecosystem.	
Focused on innovation across industry and the health system by joining up capability across commercial, research and health sectors.	Help disseminate validated data health innovations across the health system.		Health system – early access to new products; funding for research; improved tools for data science; workforce development; improved processes and guidance for health data science; increased efficiencies in health care; greater dissemination of innovations through the system and greater potential for direct returns (for example, through IP sharing, negotiated lower costs).
	Connect health data innovation and expertise with the broader health innovation ecosystem.		Research providers – access to testing and validation expertise; funding for internships; access to a greater range of expertise and support services.

ROLE

The DigiHealth Hub is part of the OuluHealth ecosystem, which represents the spectrum of health care, including specialised medical care, primary health and social care, health and wellbeing, industry and commerce, health technology research and education, and citizens.

The ecosystem's main goals are to accelerate the implementation of health innovations, boost the health-tech sector and create better solutions for the benefit of citizens. Its activities cover collaborative research and innovation, testing and piloting, and business development. The goals and activities of OuluHealth are aligned with Finnish national and regional digitalisation strategies and the implementation of the national Health Sector Growth Strategy.

FUNCTIONS

In addition to facilitating access to the DigiHealth Hub, the ecosystem provides:

» Testing and Co-creation support – support to develop ideas into market-ready products and to reach international markets. This includes access to OuluHealth Labs (three test-bed facilities). It offers user-oriented development and testing services, facilities and equipment for rent, training and expert packages tailored to the specific needs of companies, and funding support.

» Business Development support – connects individuals and businesses with global networks, potential business and research partners and experts; organises training and networking events; facilitates access to growth and internationalisation services offered by BusinessOulu; and provides marketing support by providing access to media publications, social media channels and other marketing materials.

The DigiHealth Hub component of the ecosystem supports digital transformation in the health and wellbeing sector by providing access to the latest knowledge, scientific expertise, technology and easy entry to innovation ecosystems and multi-partner cooperation (regional, national, international). It helps companies develop digital opportunities by providing access to piloting and testing environments, financing advice, and training and networking opportunities. The Hub focuses on health data practices and competences in analytics for data-driven health innovations; deployment and assessment of digital health services (machine learning, artificial intelligence, and robotics); and research and innovation in solving health challenges. Services include:

» Facilitating the digital health innovation process from identifying the challenge to the potential solution, or parts of the solution, based on needs.

» Guides, Tools, and Methods – practical tools to help individuals and businesses to utilise health data and to assess the effectiveness of digital healthcare services/ solutions.

» Outreaching, Collaboration and Strategic Partnerships – DigiHealth helps individuals and businesses to identify the right partners and forms of collaboration. This includes identifying, mapping and connecting businesses, healthcare professionals, and/or researchers from different fields to strengthen the impact of research. It also facilitates access to national and international funding instruments.

» Lessons Learned – a collection of success stories of data-driven health and wellbeing solutions and innovations. The purpose of these case descriptions is to highlight what can be possible in utilising data and AI in healthcare, and also how to avoid and overcome challenges.

RESULTS

As of 2017, about 121 companies had used the testing and co-creation support through the ecosystem, which had resulted in 56 pilot cases.

However, OuluHealth's key results have been large scale projects and processes to enable businesses, organisations and citizens to implement health innovation, such as:

» a digital self-care management on-line tool available for all citizens

» the world's first 5G test network for new health service development

» digital patient health records opened for innovation purposes, utilising open interfaces for the integration of different patient data.

BACKGROUND

OuluHealth brings together Oulu University Hospital, research institutes, academia represented by the University of Oulu and the Oulu University of Applied Sciences, VTT Technical Research Centre of Finland, Business Oulu, industry partners, scientists and the City of Oulu. Set up in 2012, OuluHealth has evolved into one of the leading digital health innovation ecosystems in Europe. There are more than 600 companies across the health, bio, e-health, med-tech, wellness, and food safety industries within the OuluHealth network. The DigiHealth Hub was established in 2018 and is driven by the University of Oulu and BusinessOulu.

Sources: From reports and material available at https://ouluhealth.fi/ and https://www.oulu.fi/cht/digihealthhub

Option 3.
Health data innovation accelerator for the health sector

SCOPE

Focused on developing and spreading innovations from businesses and clinicians throughout the health system.

Strategic partnership for expertise and access to the health system with MoH, HRC, Health NZ and the Māori Health Authority.

KEY ROLE

Identify health data R&D that will address national health system priorities.

Support the development of health data-based R&D into products and services that are disseminated through the health system.

Support access to health data and health data science capability.

KEY FUNCTIONS

Testing and validating health data R&D through a robust testing and development process.

Facilitating access to R&D and product/service development support (for example, incubation and acceleration support, mentoring).

Facilitating access to expertise from clinical experts.

Facilitating access to the health system.

VALUE PROPOSITION

Commercial – supporting the roll-out of relevant commercial health data innovations through the health system and hence sales/revenue opportunities; improved access to clinical expertise, improved access to market pathways.

Health system – accelerated dissemination of innovations through the system and flow-on health benefits; support for data health transformation projects led by health professionals.

Research providers – supporting the roll-out of research-led health data R&D through the health system; access to testing and validation expertise.

EXAMPLE OF OPTION 3: DIGITALHEALTH.LONDON

ROLE

DigitalHealth.London connects National Health Service (NHS) staff, digital health companies and academics, and equips them to improve the NHS and social care in London through digital technology.

FUNCTIONS

It offers programmes that provide bespoke advice, mentoring, education, peer networking, brand awareness and partnership opportunities, to digital health leaders who are tackling the biggest challenges facing patients and the NHS. Services include:

» An Accelerator programme, aimed at supporting the adoption of high potential digital health company innovation in London's NHS. This is a 12-month programme for digital health companies that have products or services with high potential to meet NHS and social care challenges, and as detailed in the NHS Long-Term Plan. Support includes an assigned NHS Navigator who has NHS clinical or service manager expertise; a programme of expert-led workshops and events; bespoke one-on-one advice sessions with digital health and NHS advisors; and brokering of connections between innovators and NHS organisations with specific challenges.

» A Launchpad programme. This is a three-month programme for early-stage digital health companies that have a product or service in development or ready to launch with high potential to meet NHS and social care challenges. It provides a minimum of 12 hours of support to participants over a three-month period. Support includes workshops and peer-to-peer learning opportunities; bespoke one-on-one advice from DigitalHealth.London digital health and NHS advisors; and advice from key strategic partners.

» A Generator programme that provides an expert network to support evidence generation between academics and digital health companies, so that NHS organisations can feel confident about choosing the right technologies. Digital health companies can access expertise in London's key research organisations, advisory sessions with experts in the field and support for protocol and grant writing. Researchers can gain access to innovative digital health products and services being introduced to the NHS and social care.

» A Digital Pioneer Fellowship programme to support innovators within the NHS to deliver transformation projects on the ground. The programme is aimed at NHS healthcare professionals (in London or South-East), from a range of NHS disciplines including doctors, nurses, Allied Health Professionals, project managers and IT staff. It is for individuals who are currently leading or significantly involved in delivering a digital transformation project within their organisation. Support includes action-focused learning groups; workshops and expert-led sessions on topics such as design thinking, evaluation and change management; and quarterly one-to-one mentorship with an expert.

In addition to these programmes, DigitalHealth.London has supported investment projects, run outpatient transformation events for the health sector, and has been part of a number of other initiatives which have supported the growth of digital health in London's NHS.

RESULTS

An interim evaluation of the Accelerator programme estimated that every £1 of investment generated £14.50 into the regional economy. 97 health innovators had been supported in the first four years (from over 500 applicants), with an estimated 513 jobs created. Stakeholders widely believed that the NHS was more familiar with the adoption of digital health and the key issues surrounding the technology. A broader evaluation of DigitalHealth.London's support indicated that 20 new products had been commercialised and used in the NHS and there was £76m in savings for the NHS.

BACKGROUND

DigitalHealth.London is a partnership between MedCity and London's three Academic Health Science Networks, launched in 2016. It is supported by NHS England, the Mayor's Office and CW+ (the charity of Chelsea & Westminster Hospital NHS Foundation Trust and its hospitals and clinics).

Sources: From reports available at https://digitalhealth.london/

Option 4.
Public health data innovation entity

SCOPE

Advising on, supporting the governance of, and reviewing health data science and innovation priorities and activities across the health system.

Strategic partnership with MoH, HRC, Health NZ and the Māori Health Authority.

Primarily focused on health outcomes.

KEY ROLE

Support access to health data and health data science capability.

Support the management of access to data, data protection, consent, privacy, confidentiality, data sovereignty.

Support the development of health data expertise.

KEY FUNCTIONS

Provide intelligence on health data priorities, needs, what works, where modelling could benefit the health system.

Evaluate the roll-out of health data innovations (for example, artificial intelligence).

Provide de-identification services.

Provide independent evaluations of new health data concepts and innovations for their suitability for the health system.

VALUE PROPOSITION

Commercial – supporting access to health data and hence more efficient health data innovation, including through faster clinical testing.

Health system – improved health policy and clinical decision-making through improved health data and access to the data.

Research providers – supporting access to health data and hence more efficient health data research projects and a greater range of research opportunities; improving health data research capability.

ROLE

HDR UK is the national institute for health data science. Their vision is that every health and care interaction and research endeavour will be enhanced by access to large scale data and advanced analytics. It aims to:

» Accelerate the pace and scale of health and biomedical data science to improve health and care for patients and the public.

» Provide UK-wide co-ordination of relevant informatics infrastructures, skills, capacity, methods and analytical tools.

» Work in partnership with key stakeholders across government, academia, the healthcare sector, research charities, industry and the public.

FUNCTIONS

HDR UK brings together health data assets across the UK and makes health data available to researchers and innovators to enable health data research and innovation happen at scale. It does not control any health data. It works with organisations that hold and manage datasets and supports connections between these datasets.

Services include:

» Applied Analytics and data innovation – HDR UK matches knowledge of analytical tools such as machine learning and artificial intelligence with large-scale health datasets to show their potential to inform health and care delivery. HDR UK help people gain access to the data they need, in a way that protects the data, maintains patient anonymity, and allows innovation.

» Data Standards – HDR UK works with other partners to establish and implement common standards for the quality of data used in research.

» Data Utility Evaluation – HDR UK has developed a sophisticated tool to help researchers and innovators quickly and accurately access the datasets they need.

» Synthetic Data – HDR UK is working with the research community to understand the current UK Health Data landscape on synthetic data activity.

HDR UK also provides the Health Data Research Innovation Gateway, a portal providing a common entry point to discover and request access to UK health datasets.

HDR UK has a combination of research sites, training locations and Health Data Hubs.

» Each research site contributes to one or more of the UK's six National Research Priorities: the human phenome; applied analytics; understanding the causes of disease; better, faster, efficient clinical trials; improving public health; and better care.

» Training sites support interdisciplinary training across post-graduates and research leaders. They provide Masters degree programmes and internships in health data science (via universities); a PhD programme to develop future leaders in health data science; and a Fellows programme.

» Health Data Hubs are centres of data excellence in particular fields, such pain research, mental health, respiratory conditions, and eye disease. The Hubs have an explicit mandate to improve data as part of the work they are doing to support innovation. This work includes mapping to data standards, curating the data to remove duplicates, annotating images and linking to other datasets.

RESULTS

Since their establishment in October 2019, the Hubs have:

» Made over 157 datasets available via the Health Data Research Innovation Gateway.

» Delivered over 300 projects involving hundreds of partners from across the NHS, academia and industry.

» Carried out over 20,000 meaningful patient and public interactions.

» Delivered over 2,300 training activities.

The impact of these projects has informed UK policy decisions on the effectiveness of COVID-19 vaccines, created tools to improve clinical decision-making in the management of patients with vascular disease, and driven research in cancer, heart disease and hospital care pathways by linking routinely-collected data.

BACKGROUND

Established in 2017, HDR UK is an independent, registered charity supported by 10 funders, working across 32 locations within the UK, with a central team based in London. HDR UK is governed by a Board and also draws on the experience of an International Advisory Board, a Public Advisory Board, and an Infrastructure Advisory Board. Funders include the British Heart Foundation, Chief Scientists Office, Economic and Social Research Council, Medical Resource Council, the National Institute for Health Research and UK Research and Innovation.

Sources: From reports available at https://www.hdruk.ac.uk/

MARTIN JENKINS