

**Population Health Research
Network (PHRN) Impact and
Return on Investment**

October 2017



I. Executive Summary

Context

Supporting a healthy, long-living and safe citizenry is one of the most important challenges facing Australia, or indeed any nation. Australia spends well over \$165 billion annually, or more than a tenth of GDP, on health and related social issues.

Linking of public and other data collections (or data linkage) allows researchers to efficiently generate large, powerful 'big data' analyses that provide rich insight into influences on health, and the safety, quality and costs of interventions – often in ways not previously possible. This research can inform improvements to health and social sector policies, practices and technology, to increase national wellbeing through better health and/or lower health and social services costs (Figure 1).

The Population Health Research Network (PHRN) is a national network of organisations responsible for data linkage infrastructure across Australia. Since 2009, PHRN has been resolving the complex technical, institutional, legal and skill challenges that impede the effective production and use of linked data.

Pathways for Generating Impact

Supported by PHRN resources, systems and processes, jurisdictions are moving towards systematically linking more data collections on a routine basis, starting with more commonly used or requested data collections.

Routine data linkage allows linked data sets to be produced more efficiently, which leads to researchers and other users getting many months' faster access to data, and more timely research results.

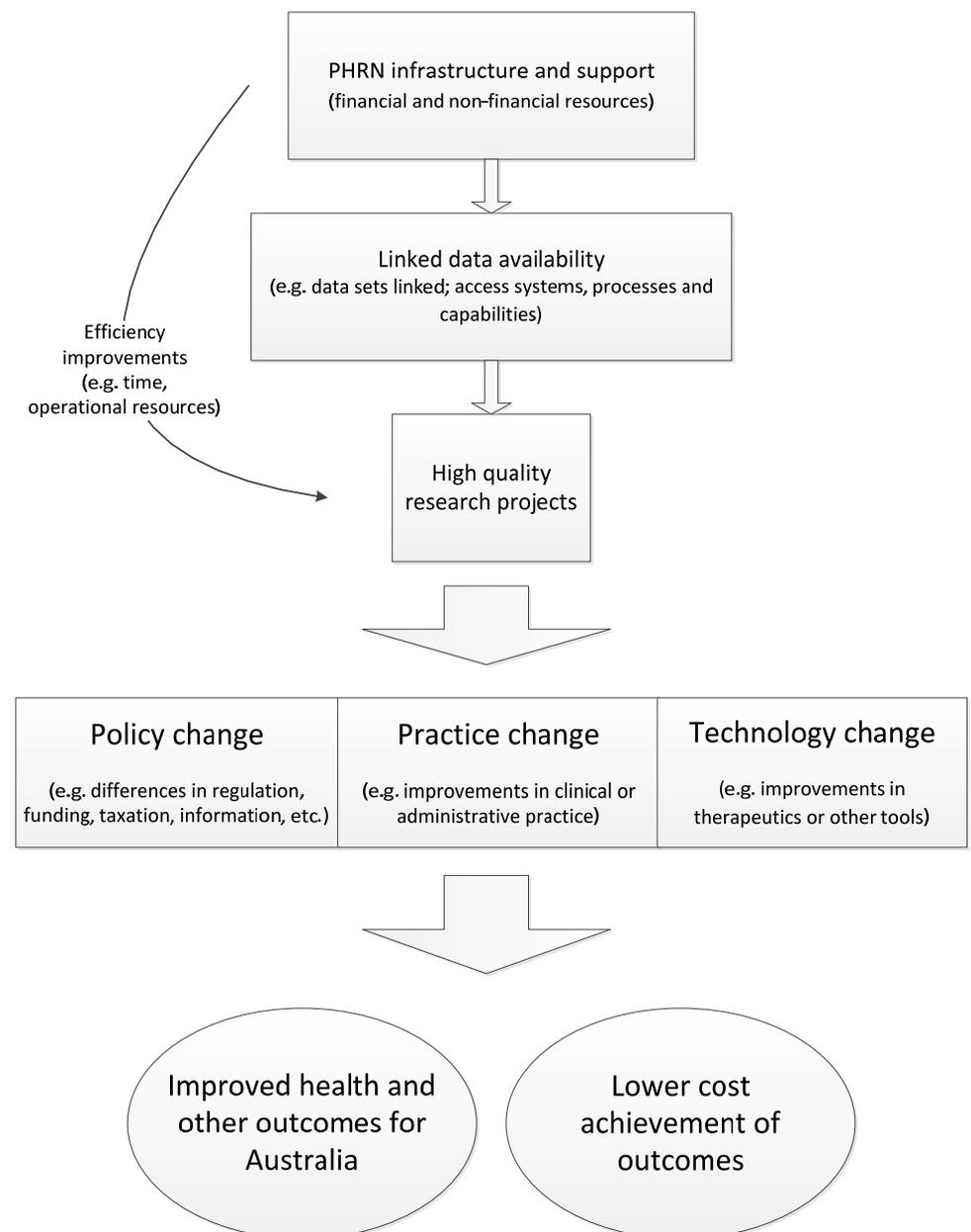
There is a clear upward trend over recent years in researchers seeking and, following ethical and other approvals, accessing PHRN-related linked data. This is consistent with new availability of linked data and greater awareness across user groups. Cancer and cardiovascular disease appear to be two of the most significant subjects for formal research projects. The increased power that linked data creates means that the data is useful not just to population health researchers but also now to clinical and policy researchers. New uses for the data are also arising adjacent to pure health research as for instance with research into social issues such as homelessness and child development.

Over the five years 2010-11 to 2015-16, at least 390 peer-reviewed publications have emerged from PHRN-related formal research, with nearly half of these in 2015-16 alone. Government departments are beginning to utilise linked data for both published and unpublished or informal monitoring and analysis in a range of settings.



Stakeholders expect this kind of growth to continue, as further data collections are linked on a routine basis within and across jurisdictions, and as the benefits are further demonstrated. Arguably, we are at the 'tipping point' of moving beyond early adopter projects into consolidation as a mainstream approach, particularly as enduring linkage of rich Medicare Benefits Scheme (MBS) and pharmaceutical data is fully implemented and access lags reduced.

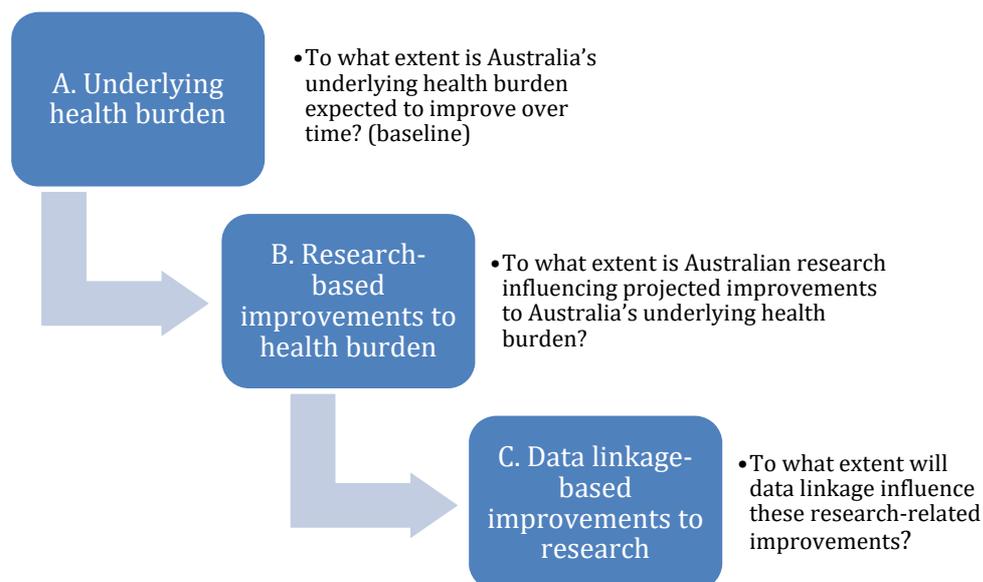
Figure 1 – Overview of 'value chain' of PHRN intended impacts over the longer term



Indicative Economic Analysis

The indicative economic analysis of PHRN's current and future impact considers the cumulative national effect of PHRN infrastructure on health outcomes over time, building on the framework and evidence above. Using a cost-benefit analysis approach, three-cascading questions (Figure 2) provide the structure.

Figure 2 – Cascading logic of economic assessment



To do this, the analysis considers four hypothetical scenarios for PHRN beyond 2018-19 (Table 1), considering costs and benefits to 2040-41. The scenarios reflect different levels of future maintenance and development of data linkage infrastructure, for example in drawing in further data collections and streamlining access. The timeframe allows for a ramp-up of impacts over time as research with linked data is conducted and, over time, influences decision-makers.

Table 1 – Hypothetical scenarios for PHRN resources from 2019

Scenario	Description
Scenario A	All annual resources slightly increase by 2.5% (in real terms) after 2019
Scenario B	All annual resources are maintained (in real terms) after 2019
Scenario C	Participant annual resources are maintained (in real terms) after 2019 but no further resources from the Australian Government through NCRIS or a similar initiative
Scenario D	No further resources for data linkage development after 2019.



Drawing assumptions from literature and stakeholder feedback, Table 2 summarises our best estimates of the net benefit of PHRN.

Table 2 – Summary of net benefit of PHRN by scenario (present value \$2017)

Scenario	Benefits	Costs	Net benefit	Foregone net benefit relative to Scenario A	Benefit to cost ratio
Scenario A	\$7,588 m	\$460 m	\$7,128 m	-	16.5 to 1
Scenario B	\$6,718 m	\$403 m	\$6,316 m	\$812 m	16.7 to 1
Scenario C	\$5,403 m	\$330 m	\$5,072 m	\$2,056 m	16.3 to 1
Scenario D	\$2,637 m	\$208 m	\$2,429 m	\$4,699 m	12.7 to 1

The general finding is that PHRN-related data linkage is expected to make the Australian community substantially better off.

Scenario A indicatively suggests a net economic benefit for Australian society from PHRN-related data linkage of over \$7 billion, expressed as a present value in 2016-17 dollars.

These benefits reflect PHRN-related research contributing to policy, practice and technology improvements over time. For example, the analysis suggests that by 2034 over 0.53% of cancer burden reduction in Australia will be attributable to PHRN-related data linkage.

Scenario A has a benefit to cost ratio of 16.5, or over \$16 in value for Australia for every \$1 in cost.

Other scenarios also show strong net benefits. However, the extent of net benefit decreases through scenarios B, C and D, reflecting foregone net benefit relative to scenario A. Under Scenario A, Australians are well over \$4.5 billion better off than Scenario D, in present value terms. The difference is less between the other scenarios. There is also arguably a higher degree of uncertainty regarding the realisation of benefits in scenarios that may not include strong coordination of national linkage development.

While we have attempted to be conservative, these indicative results (including the distinction between scenarios) are sensitive to the assumptions used and should be interpreted with care. Sensitivity testing suggests that, for Scenario A, the net benefits could be as high as \$17 billion or as low as \$1.2 billion under alternative reasonable assumptions. They also suggest that PHRN will generate substantially more benefits than costs to Australia even under systematically pessimistic assumptions for Scenario D which involves the least development of data linkage.



Data linkage is an emerging area of public management and the realisation of much future benefit is highly dependent on how data custodians, user groups in government, academia and the professions, and end-users of research insights, learn and evolve their understanding and practices.

While this indicative analysis provides confidence that PHRN is likely to be a good investment for Australia, future investment priorities and decisions are best made through focused assessment of specific investment proposals and how they seek to accelerate progress across the impact pathway.



Purpose and scope of this document

Lateral Economics has been commissioned by the PHRN to assess the impact of and return on the PHRN investment since 2009. This includes the impacts to date as well as expected future impacts.

The analysis in this report was developed through synthesising extant documentation, reviewing economic and other literature, and seeking feedback from research, government and sector stakeholders including PHRN Participants, researchers and others.

The report is structured as follows:

- An Executive Summary of key points is Section I.
- Section II is this Introduction providing background and scope of the project.
- Section III highlights the strategic challenge which is the context for PHRN.
- Section IV sets out a framework for conceptualising the impact pathways of PHRN data linkage infrastructure, summarises the outputs it has delivered, and the nature and scale of usage by research groups, government agencies and more broadly.
- Section V furthers this by providing a quantitative-based indicative economic analysis of the society-wide benefits and costs of PHRN, including into the future.

