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A call to action: More collaborative implementation research is needed to prevent chronic disease

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Fifty per cent of all known health risk factors could be redressed with known, effective preventive policies or practices.¹ Yet, widespread uptake of effective prevention is uncommon.² Lack of program funding in prevention may be one reason why opportunities are missed.³ Another critical impediment is that there is insufficient field-level evidence on how to scale-up interventions across wider populations and adapt to different contexts without loss of fidelity. Implementation research seeks to address this important evidence gap, moving beyond research to describe, understand and test the effectiveness of prevention interventions on measures of community health, to instead describe, understand and test how effective prevention interventions are implemented integrated and adapted into clinical and community systems.⁴ Implementation research has considerable potential to improve public health. For example, reviews suggest that effects of interventions could be enhanced by two to 12 times with appropriate, relative to poor, implementation.⁵ However, as shown in

Figure 1, evidence generation in intervention research remains skewed towards studies of efficacy, or 'what works,' in contrast to studies of how we can apply that knowledge in practice and maximise benefits.

Implementation science is a field that has evolved to address this gap. Implementation science examines how to improve the translation of evidence-based interventions into routine practice.⁹ It includes studies of program scale-up across populations¹⁰ where the essential question is, was the program carried out as intended and what did it take to do so, alongside studies which identify local system dynamics and the knowledge generated from practitioners through the act of implementation.^{11,12} The latter reveal the multiple roles or functions programs can take in different contexts, which can be vital for supporting their sustainment.^{12,13} Thus, for many researchers, the focus of attention in implementation science expands to also include the insights and methods of improvement science, i.e. the science that underpins how practitioners attempt to solve problems and promote quality.¹³⁻¹⁵

Implementation science is recommended by the World Health Organization and other international agencies to maximise the impact of prevention policies and programs.¹⁶ However, Australia risks lagging behind unless we seek new ways to maximise investment and coordinate scarce research resources. Recognition that practice is both a "context for discovery" as well as a "context for program or practice delivery"¹⁷ also invites stronger collaborative research partnerships with state-based agencies and non-government organisations responsible for implementing prevention. We outline opportunities below to strengthen chronic disease prevention in Australia.

Increase investment in implementation research for chronic disease prevention

We need sufficient increase in both national (NHMRC/MRFF-level) and state-level investment in implementation research in prevention to transform our current capacity, alongside tracking systems to trace investment flow and benefit.

Bibliographic studies of public health research show small changes in the volume of implementation research publications over time, and that such research represents a fraction (as low as <3%) of public health research output.¹⁸⁻²⁰ In Australia, between 1993-2020, just 1.3% of National Health and Medical Research Council (NHMRC) funding was allocated to research focussing on translation, and this has never exceeded 5% in a single year over this period.²¹ Only a fraction of this research focused on chronic disease prevention. Inherent in the objectives of the Medical Research Future Fund (MRFF) Strategic Plan 2021-26 is the need for significantly higher investment in implementation science, as without effective implementation its mission to improve the effectiveness and efficiency of the health system will not be achieved.²² The outcomes of MRFF funding have not been reported by research translation stage. However, we note after reviewing publicly available information on the website that 'implementation' is used in 65 of the 681 funded project summaries. Of these, 26 were judged as implementation science projects, nine of which focused on chronic disease prevention, representing

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1.3% of all funded projects and <1% of total MRFF funding (as of 3/12/2021).²³

Meanwhile, prevention agencies, i.e. those responsible for establishing policies that influence health (such as government departments of health) and those which build the capacity of organisations to implement prevention policies or practices (e.g. statutory prevention agencies, regional health promotion units and non-government agencies) have limited dedicated budgets, capacity and capability to support the generation and use of implementation research. Without research roles and functions purposefully embedded within prevention agencies, non-research activities may be prioritised (e.g. program outputs, delivery, and operation). At best, 10–15% of program budgets are typically recommended for evaluation, which includes implementation assessment as part of process evaluation often conducted by external evaluators. Yet many have questioned if this amount is sufficient.^{24–27}

Restorative allocation of research funding to align with at least that conservatively recommended, would greatly enhance prevention-focused implementation research capacity, notwithstanding the existing investment by health promotion agencies in Australia.²⁸ The greater engagement of key prevention agencies in research prioritisation

of such enhanced funding in Australia would enable investments in prevention implementation research to occur in areas with the greatest potential for impact.

Harness improvement science and 'learning systems' science to increase uptake of effective preventive interventions

We urge further exploration and development of learning-from-practice, as part of collaborative partnerships for implementation between prevention researchers, policy makers and practitioners.

Internationally, governments are investing heavily in transforming health services into 'learning health systems'.²⁹ Learning health systems are characterised by the continuous generation and use of evidence by health services. They are considered international best practice to optimise health care²⁹ and are consistent with a complexity science approach to knowledge transfer.³⁰ In other words, learning systems encourage plan-do-study-act cycles and seek to not simply create practitioners 'competent' to implement a familiar practice in familiar contexts, but 'capable' of analysing and learning from unfamiliar problems in unfamiliar contexts.^{14,31}

Learning systems are often facilitated through practitioner-scientists who have the dual

responsibilities of both delivering patient care and applying scientific methods to improve clinical care and the performance overall of health services.³² Creating strong research roles within clinical practice has major benefits. Within hospitals, for example, a dose-response relationship exists between levels of research engagement (assessed in terms of hospital-level engagement in clinical trials) and patient mortality and survival. In the case of cancer, the amount of population benefit for patients attending research-engaged hospitals is similar to that of therapeutic breakthroughs, such as adjuvant chemotherapy.³³ It is worth noting that, in Australia, the NSW Health Outcomes Initiative set out to foster research in practice and research culture among clinicians and managers some thirty years ago.³⁴

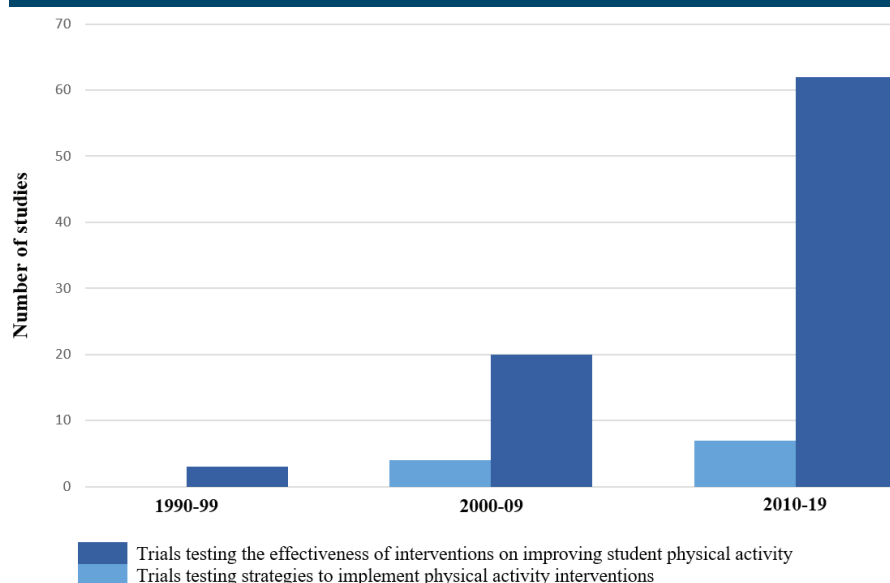
Learning health systems have also been recommended to improve policy implementation in the field of disease prevention.³⁵ Doing so in this country would further support story telling about change processes from actors and voices on the frontline. Australia has a strong tradition of practice-based health promotion evaluation.^{36–38} A learning systems approach would encourage and legitimise more diverse accounts of change, allowing the knowledge needed for implementation from the "bottom-up" perspective to complement the knowledge for implementation as perceived from the "top-down."¹¹ But investment in this approach is lacking.

Build infrastructure for collaborative implementation research in prevention

We need greater infrastructure development for implementation research in prevention: training, data systems, processes of ethical review and more practitioner-scientists working across research and practice contexts.

Capacity to translate evidence into practice and generate knowledge from practice requires a proactive strategy. Significant investments have been made in Australia to provide infrastructure to improve medical care,³⁹ including those undertaken as part of the Commonwealths Clinical Trials Project Reference Group (CTPRG) and the former Council of Australian Governments (COAG) Health Council clinical trials agenda.⁴⁰ By contrast, investments for public health implementation research are limited. For example, the Australian government has

Figure 1: Comparison of school-based physical activity behavioural intervention randomised trials^a versus implementation randomised trials^b by decade.



Notes:
a: Data for behavioural trials were sourced from a Cochrane systematic review examining school-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18⁶
b: Data for implementation trials were sourced from two systematic reviews examining strategies for enhancing the implementation of school-based policies or practices targeting risk factors for chronic disease^{7,8}

funded Advanced Health Research and Translation Centres (AHRTCs) which broadly seek to accelerate research translation and improve health care. These centres have an explicit remit to build research capacity (including in implementation science) and foster partnerships between researchers and end-users.⁴¹ Despite this, few appear to include a focus on chronic disease prevention. Building prevention agency capacity to engage in implementation research are partially supported through schemes like NHMRC partnership grants and the MRFF. However, these schemes are project specific, opportunistic and while they may have incidentally supported some prevention focused implementation research initiatives, these schemes are not providing sufficient support and incentives to re-orient prevention researchers and agencies towards working towards a prevention-focused learning health system. Government funding of core infrastructure to support learning health systems for prevention is required.⁴² Review and realignment of AHRTCs, the former COAG Health Council clinical trials agenda and NHMRC and MRFF research funding schemes could be pursued to ensure that both clinical health and chronic disease prevention services can benefit from such investments.

A range of factors may impede organisations adopting a learning system approach, including stakeholder, workforce and academic engagement, staff capacity and skill, leadership, resources, and data availability and organisational processes.⁴³ Overcoming these requires prevention agencies to be sufficiently equipped to support and embed implementation research and to use it to guide decision making. This includes training and the appointment of public health practitioners with implementation research expertise.⁴⁴ Foundational infrastructure required to achieve this also includes supportive policy and legislation, processes for efficient ethical and research governance review, multi-agency networks and learning communities, capacity building of staff, the establishment of data systems, and processes enabling joint employment (between Universities and prevention agencies) of practitioner scientists.³⁶ In the context of a learning system to support prevention, implementation research will increasingly be undertaken by prevention agencies, rather than traditional academic institutions. Public

health practitioner researchers embedded within prevention agencies will have to navigate the blurred boundaries between quality improvement (including evaluation), and research.³⁹ The ethical requirements and oversight of the latter may impede the timely collection and real-time use of data to inform improvement.³⁹ Ethical frameworks for the generation and use of evidence as part of learning health systems have been proposed⁴⁵ and may need to be adapted to support such systems aims at improving prevention practice.

National non-government organisations have research and evaluation infrastructure that could be expanded to support learning systems approaches to prevention. Health departments in some jurisdictions have also invested in supportive infrastructure to foster the generation and use of evidence by prevention health services. For example, the NSW Ministry of Health provides IT infrastructure to support data linkage, grants to support health service initiated research in priority areas, research training, guidance and capacity building support for the population health workforce.⁴⁶ Locally, an implementation community of practice between the population health units of three Local Health Districts in NSW has been established with the support of the National Centre of Implementation Science. The units are each undertaking RCTs of independent strategies to support the adoption and implementation of health promotion intervention in schools. They have harmonised key research methods to do so, are using shared evaluation and data collection infrastructure, and have processes to facilitate knowledge exchange between units, collective learning and inform future improvement.

Encourage collective priority-setting and co-ordination of implementation research

National, cross-jurisdictional structures for implementation research co-ordination in prevention are needed, including joint priority setting, research registries and collaborative implementation laboratories.

Capacity for implementation research would also be enhanced through structures that promote greater mutual understanding of research priorities for prevention. Collective research prioritisation is recommended as a core element of the WHO Global Strategy and Plan of Action on Public Health, Innovation

and Intellectual Property to facilitate needs-driven, essential health research and to mobilise resources for its production.⁴⁷ The greater engagement of key prevention agencies in research prioritisation processes in Australia would enable prioritisation of investments in implementation research with the greatest potential for impact; and help avoid research duplication or waste.⁴⁸ For example, implementation science has the potential to have an immediate impact on community health.⁴⁹ Implementation research could be prioritised to help address critical public health challenges in this country, such as rural and remote health, that has been the focus of just 2% of NHMRC funded projects despite health services in these localities serving 30% of the Australian population;⁵⁰ or Aboriginal health where health inequities are both considerable and enduring.

The articulation of joint priorities by key prevention agencies can inform the priorities of funding agencies like NHMRC and MRFF that drive research activities in this country, and leverage academic resources in the production of evidence needed to support decision making. Indeed, aligning the 'research triangle' of end-users, researchers, and funders has been a focus of the European Commission's Directorate of Research to improve the impact of health research investment.^{51,52}

While research prioritisation processes with prevention agencies has been undertaken in some jurisdictions and within broader prevention partnerships,^{53,54} there is now an urgent need in Australia for a formal and national implementation research prioritisation process, conducted in collaboration with leading prevention agencies. The incorporation of implementation research within the scope of research prioritisation processes proposed in the National Preventive Health strategy could represent one strategy for achieving this.⁵⁵

Collective research priorities and publicly available registers of prevention implementation research would provide a basis for research co-ordination, collaboration and knowledge exchange between prevention agencies. Specifically, multi-agency and cross-sectoral research partnerships around shared priorities will enable prevention researchers and partner agencies to leverage each-others expertise, resources and infrastructure; and create critical mass investment to support large

transformative implementation research projects, particularly for smaller agencies with limited networks or capacity.^{56,57} Such collaborations at the international level have taken the form of collaborative 'implementation laboratories', where research to address priority implementation evidence needs of health services are co-ordinated, and research findings shared for collective gain and health care improvement.⁵⁸⁻⁶⁰

Poor co-ordination of public health research has been observed internationally as an impediment to evidence informed prevention policy and practice.⁶¹ In response, a number of agencies internationally are seeking to facilitate the coordination of public health research, including the UK's Office of Strategic Coordination of Health Research, established following the landmark Cooksey review and Cancer Prevention Europe.^{61,62} In the Australian context, prevention agencies in some jurisdictions have achieved impressive policy impacts through strategies to support research-policy partnerships, including funding research infrastructure and priority research projects.^{63,64} Such strategies require expansion into national cross-jurisdiction collaborative efforts with explicit focus on prevention oriented implementation research.

Foster national, state and local leadership in prevention implementation research

Leadership operating at all levels should encourage infrastructure investment, innovation, multi-sector problem solving, critical reflection, and learning.

The re-establishment of a national prevention agency represents one mechanism to support the generation, use and co-ordination of implementation research by Australian prevention agencies. The inclusion of such functions within the governance structures of the National Prevention Health Strategy represents another opportunity for such national leadership.⁵⁵ In addition, other organisations, both government and non-government, have a national prevention presence in Australia that could provide important leadership roles in transforming the production and use of prevention focused implementation research. One example is The Australian Prevention Partnership Centre,⁶⁵ a joint NHMRC and end-user funded collaborative centre bringing together leading prevention agencies and academic investigators across Australia. It

has established infrastructure to build the research capacity of prevention agencies and to support knowledge exchange and translation. The Prevention Centre's existing partnerships with key prevention agencies (e.g. Cancer Council Australia, jurisdictional departments of health) affords it both knowledge of prevention agency evidence needs and opportunities to facilitate multiagency prevention research priority setting. It also has experience in the development of structures to support research co-ordination across its partners and researchers and in value adding to existing NHMRC funding, including its initiation of the Collaboration for Enhanced Research Impact, which networks the Prevention Centre and a number of prevention focused NHMRC Centres for Research Excellence.⁶⁶

While national level leadership and investment is critical, perhaps the greatest need and opportunity to improve the implementation of chronic disease prevention policies in the immediate timeframe is through greater research and partner engagement, at the local level, that is, between local health services and their community partners and stakeholders.⁶⁷ Stakeholder-based engagement in implementation research has been recommended to redress structural bias toward inequity and racism inherent in many evidence based interventions.⁶⁸ Research and evaluation are core competencies of this workforce,⁶⁷ and both are recommended to occur routinely as part of prevention efforts, and which could be used to improve program impacts as part of quality improvement processes.

Conclusions

Reviews of past Australian prevention initiatives, including the National Partnership Agreement on Preventive Health,⁶⁹ have concluded that successful action requires evidence-informed implementation strategies. The recently released National Preventive Health Strategy⁵⁵ goes some way to addressing this, with its focus on governance mechanisms, greater funding for prevention, workforce capacity building and investment in data systems. However, while it also acknowledges "... an opportunity to better inform our prevention efforts through a greater focus on implementation research ..." it provides little specific guidance about how this can best be achieved. Here, we offer our view about how this could be achieved and

see a guiding role for prevention agencies at the local, state and national levels in the generation of evidence they need to support implementation of prevention initiatives at scale. Enhanced investment in supporting learning health system approaches to prevention, prioritising implementation evidence needs, facilitating prevention research collaboration and co-ordination, and leadership at multiple levels are all required to make the most of limited resources and guide effective chronic disease prevention action.

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