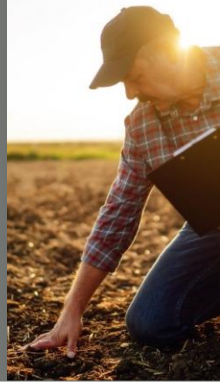
9. MNZH MAKE NEW ZEALAND HEALTHY

Science for Healthy People & Healthy Systems.



THE PROBLEM: Modern science systems should function as an intelligent national knowledge system, but New Zealand lacks a dedicated long-term capability for sustained public-good research into environmental health, agricultural system resilience, and the underlying determinants of population wellbeing. Basic research to understand pollution and human health drivers is poor.

Responsibility for research and science was historically kept at a distant from political agencies, but in 2013–2014 New Zealand's science system was put under the control of the Ministry of Business, Innovation and Employment (MBIE) – the very moment it was created. Officials achieved this quietly, through secondary legislation. There was little opportunity for parliamentary scrutiny or public input into a decision that fundamentally altered how the nation's research and science system is directed.

From a governance perspective, this has never made sense. The responsibility for science system policy and much of the nation's research funding within an agency dedicated to economic outcomes – left non-economic research in the cold. Many human and environmental health problems are a consequence of exposures to the very innovations that are developed to support economic growth and innovation. MBIEs legislative purpose did not include explicit public-good science obligations.

MBIE subsequently developed policies that required research proposals to consistently show a pathway to 'innovation'. Funding favours research capable of producing identifiable technological or commercial outputs. The direct impact was that knowledge-driven public-good research, particularly work aimed at understanding emerging risks, chronic problems and system failures, became harder to prioritise Research into environmental monitoring from industrial, agricultural and urban activities, soil degradation, water contamination, and human health research into chronic illness is now rare.

Yet innovation is most effective when it is grounded in a deep understanding of the problems it seeks to address. Many national challenges are complex and interconnected, requiring multidisciplinary research, sustained monitoring, and long-term knowledge development. By prioritising innovation pathways as a funding condition, the system shifted away from science's primary function: generating reliable knowledge about how human, environmental and productive systems are performing. Researchers increasingly frame projects around innovation outcomes before applying for funding.

THE SOLUTION: Enact a Research, Science and Technology Stewardship Act to re-establish independent science as a core national capability serving the long-term wellbeing of people, ecosystems and infrastructure. Through continuous monitoring, integrated datasets, basic research into the drivers of health and global advances in understanding, and advances in analytical technologies, research institutions can generate real-time feedback about the health of key national systems, human health, water, soils, agriculture and infrastructure.

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MNZH POLICY RECOMMENDATIONS

RESEARCH, SCIENCE AND TECHNOLOGY ACT

Institutional Stewardship of an Integrated National Science System

See the Appendix for sample legislation.

Re-establishing a coherent national science architecture would restore the foundational role of publicly funded research: generating the knowledge required to understand and steward the nation's human, environmental and productive systems. This could be achieved through the creation of a dedicated Ministry of Research, Science and Technology, the establishment of a national Institute for Human and Environmental Health Research, and a strengthened public-good statutory mandate for AgResearch, alongside renewed emphasis on long-term (horizon) basic research and science, national monitoring capability and major public-good research infrastructure.

The legislation would embed stewardship and kaitiakitanga as first principles guiding decision-making within the science system. Public research institutions would therefore be explicitly tasked with contributing to the long-term wellbeing of people, ecosystems and national infrastructure in Aotearoa New Zealand.

Such a system would be designed to create functional feedback loops between research, government, industry and the public, allowing emerging risks and opportunities to be identified earlier and addressed more effectively. By restoring discovery science, long-term monitoring and multidisciplinary investigation as core national capabilities, New Zealand could rebuild a science system capable of supporting healthier populations, resilient environments and a more intelligent economy in the decades ahead.

The governance structure (the machinery of government) through which a state organises its scientific capability is not merely administrative; it is a matter of constitutional design. Public research institutions form part of a nation's knowledge infrastructure, supporting evidence-based governance, environmental stewardship and the protection of human health. For this reason, the institutional location and mandate of science policy has historically been determined through deliberate legislation rather than incidental administrative arrangements.

1. Re-establish a Ministry of Research, Science and Technology (MoRST) as the central public authority responsible for stewardship of the national research, science and technology system, replacing the current administrative arrangement in which science policy is embedded within a broader economic development ministry.

The Ministry would have statutory responsibility for maintaining the integrity, capability, and public accountability of the national science system.

2. Establish a statutory Institute for Human and Environmental Health Research, responsible for long-horizon interdisciplinary investigation into the biological, environmental and social determinants of human health and disease, including but not limited to:

i. metabolic disease and metabolic regulation
ii. neurodevelopmental vulnerability and brain health
iii. psychiatric and mental health determinants
iv. nutrition science and nutrient adequacy
v. endocrine disruption and chemical exposures
vi. cumulative toxic exposures and chemical mixtures
vii. urban wastewater and industrial emissions
viii. agricultural pollutants and environmental contaminants
ix. groundwater, drinking water and ecosystem health
x. long-term environmental determinants of disease.

The Institute would function as a national research platform capable of undertaking sustained multidisciplinary inquiry into slow-moving and cumulative drivers of disease and environmental degradation.

3. Affirm AgResearch in statute as a public-good agricultural science institution, tasked with supporting the resilience, sustainability, and productivity of New Zealand's agricultural systems across pastoral farming, horticulture, arable systems, forestry and dryland agriculture.

4. Establish statutory duties on the Ministry to maintain national scientific capability in domains essential to the long-term wellbeing and resilience of New Zealand, including environmental health, agriculture, nutrition science, chronic disease causation, environmental toxicology, and the environmental determinants of human health.

5. Provide for coordinated national monitoring and knowledge infrastructure, enabling the research system to generate continuous scientific intelligence about the condition of the nation's key biological and environmental systems, including environmental pollutants, chemical exposures, soil systems, water systems, and population health determinants, as well as inform the design, maintenance and long-term management of national assets.

Legislative Purpose

A Research, Science and Technology Stewardship Act would establish a coherent public-interest science architecture capable of supporting long-term national wellbeing. At present, a growing share of New Zealand's research funding is directed toward innovation designed for global markets rather than toward systematically identifying and solving New Zealand's own environmental, health and infrastructure challenges. When the science system lacks the institutional capacity to detect emerging problems, research funding risks being misdirected toward solutions that do not address the nation's most pressing needs.

The inclusion of infrastructure stewardship within the purpose of a research and science statute reflects the historic role of public science in informing the design, maintenance and long-term management of national assets. From the earliest scientific institutions, states established laboratories and research agencies to generate knowledge about water systems, land productivity, geological stability, energy resources and other physical systems that underpin public infrastructure.

Infrastructure decisions, whether concerning drinking-water systems, wastewater treatment, transport corridors, land use, energy networks or urban development, are fundamentally scientific and technical questions. They require sustained knowledge of environmental processes, materials behaviour, ecological interactions and human health effects.

A national science system therefore functions not only as a driver of innovation but also as an intelligence capability that allows governments and communities to steward long-lived infrastructure responsibly. Embedding this role within a research and science statute recognises that effective infrastructure policy depends upon robust, publicly accessible scientific knowledge about the environmental, biological and physical systems on which those assets depend.

The purpose of the Act would therefore be to restore research, science and technology as a core public capability of the State, directed toward the stewardship of human health, environmental systems, productive resources and national knowledge infrastructure.

BACKGROUND TO THIS POLICY

Many of the dominant challenges now facing New Zealand arise from complex interactions between biological, environmental, human development and social systems that unfold over decades rather than years. Addressing these challenges requires institutional arrangements that prioritise stewardship, long-term knowledge generation and public accountability.

Historically, New Zealand recognised this need through the establishment of dedicated science governance institutions, including the Department of Scientific and Industrial Research (DSIR) and later the Ministry of Research, Science and Technology. These institutions were not created solely to promote technological development. Their role was to maintain national scientific capability and generate the knowledge required for informed public decision-making. Their statutory foundations reflected an understanding that the research system performs a core public function: producing systematic knowledge about the condition of the nation's environmental, biological and productive systems.

In contemporary public administration, science stewardship sits primarily within a ministry whose central mandate is economic development. Economic ministries are designed to promote productivity, innovation, industry growth and labour market performance. These are legitimate and important objectives. However, they differ in character from the responsibilities associated with maintaining national scientific capability, which include sustaining discovery science, long-term monitoring and independent knowledge generation for regulatory and public decision-making.

When science governance is embedded within an economic policy ministry, a degree of institutional path dependency can emerge. Funding criteria, strategic priorities and advisory frameworks tend to align with economic development objectives, even where other public-interest research needs, such as environmental monitoring, chronic disease causation, nutrition science or environmental toxicology, require sustained investigation without immediate commercial outputs.

Maintaining the Integrity of Key Public Functions

Recent reforms of the science system illustrate this tension. While the proposed structures may appear more integrated, they continue to prioritise research and innovation pathways oriented toward economic growth. Clear research trajectories addressing New Zealand's urban, agricultural, environmental and population health challenges are much less visible within New Zealand's research, science and technology system.

Public law has long recognised the importance of institutional design in maintaining the integrity of key public functions. Just as the independence of courts, statistical agencies and auditors-general is protected to preserve the credibility of their outputs, the stewardship of the national science system benefits from governance arrangements that distinguish knowledge generation from policy promotion. A dedicated Ministry of Research, Science and Technology provides such a structure by establishing science stewardship as a primary function of government rather than a subsidiary component of economic policy.

Re-establishing a dedicated science ministry would not diminish the importance of innovation or economic development. Rather, it would restore a clearer institutional architecture in which discovery science, national capability development and long-term monitoring form the knowledge base upon which innovation, regulation and public policy can responsibly proceed. In this way, the science system can fulfil its broader constitutional role: generating reliable knowledge about the condition of New Zealand's human, environmental and productive systems.

A Small Country: Innovation Informed by Public-Good Discovery

Innovation remains an essential component of a modern science system. However, innovation is most effective when grounded in strong public-good discovery science that identifies the real problems requiring solutions. When innovation becomes an end in itself, detached from systematic investigation of national health, environmental and infrastructure challenges, it risks producing technologies or programmes with limited relevance to New Zealand's circumstances.

A robust discovery-science foundation ensures that innovation is directed toward genuine national needs, including improving metabolic health, protecting water systems, strengthening food systems and safeguarding environmental resilience.

Public investment in research, science and technology should therefore support the long-term stewardship of New Zealand's human, environmental and infrastructure resources, rather than focusing primarily on innovation pathways driven by global technology markets or short-term commercial opportunities. Discovery research into nutrient adequacy, metabolic disease, environmental toxicology, water systems, soil health, agricultural systems and cumulative pollutant exposures provides the evidence base required for innovation that genuinely improves national wellbeing. In this way, innovation becomes a consequence of understanding, rather than a substitute for it.

At present, New Zealand's science and regulatory systems operate largely in parallel rather than as an integrated stewardship framework. Monitoring, regulatory decision-making and publicly funded research are not systematically connected through feedback loops. As a result, emerging problems observed in the field do not reliably inform research priorities, and new scientific knowledge is not consistently translated back into regulatory practice or practical innovation.

In a small country with finite public science funding, this fragmentation matters. Public research investment should be directed toward solving persistent New Zealand problems with broad environmental, agricultural and population-level consequences. One example is the growing resistance of weeds to glyphosate and other herbicides, which is increasing management costs and operational difficulties for farmers.

Addressing such challenges requires purposeful innovation. New Zealand could, for example, establish a national research centre for agricultural robotics and precision weed management, developing robust, weather-tolerant technologies suited to the country's farming conditions. Integrating robotics, machine vision, agronomy and ecological weed control could reduce herbicide dependence while strengthening farm productivity and environmental outcomes.

At present, however, such integrative solutions receive limited strategic attention within the wider science system. Institutional pathways linking agricultural challenges, regulatory knowledge and research funding remain weak. By contrast, greater investment has flowed toward genetically modified and gene-edited technologies, which fit more readily within existing innovation funding frameworks because they generate patentable intellectual property and potential royalty streams for public research institutions.

While such technologies may have a role, a balanced national science system should ensure that public-interest discovery science and practical problem-solving for New Zealand's environmental and agricultural systems remain central priorities.

[1] WHAT IS A PUBLICLY FUNDED SCIENCE SYSTEM FOR, ANYWAY?

Classical Foundations of the Public Role of Science

The public role of research and science has long been understood to extend beyond the production of commercial technologies. Publicly funded science serves to generate knowledge, build national expertise, inform education, and support evidence-based governance. In his influential report Science, The Endless Frontier, Vannevar Bush argued that scientific progress arises from 'the free play of free intellects' pursuing curiosity-driven inquiry, and that technological advances ultimately depend on sustained investment in basic research.[1] Bush's central insight was that innovation cannot be reliably commanded in advance; it emerges from the accumulation of understanding.

Subsequent scholars elaborated this principle from different perspectives. Michael Polanyi described science as a self-organising "Republic of Science," in which knowledge develops through the distributed judgement of independent researchers rather than through central direction. [2] Attempts to narrowly steer inquiry, he argued, risk constraining discovery and reducing the diversity of knowledge produced.

Sociologist Robert K. Merton likewise emphasised the communal character of scientific knowledge, noting that the substantive findings of science are 'a product of social collaboration

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[1] Bush, V. (1945). Science, The Endless Frontier: A Report to the President on a Program for Postwar Scientific Research. Washington, DC: United States Government Printing Office.
[2] Polanyi, M. (1962). The Republic of Science: Its Political and Economic Theory. Minerva, 1(1), 54–73. DOI: 10.1007/BF01101453

and are assigned to the community'.[3] Because scientific knowledge accumulates across generations and benefits society broadly, it functions as a public good, strengthening the rationale for public investment in foundational research.

Donald Stokes later clarified the relationship between discovery and application in Pasteur's Quadrant, demonstrating that many transformative advances arise from use-inspired basic research, where the pursuit of fundamental understanding and practical problem-solving proceed together.[4] In this model, the most productive innovation systems are those grounded in strong discovery science capable of identifying and understanding real-world challenges.

More recently, Sheila Jasanoff has emphasised that scientific knowledge is inseparable from the processes of governance and public reasoning. In States of Knowledge, she argues that modern societies rely on credible knowledge institutions to mediate between scientific understanding and democratic decision-making.[5] Where such institutions are weakened, the capacity of governments and societies to evaluate risks, deliberate on technological choices, and maintain public trust can be compromised.

Taken together, these perspectives establish a consistent principle: the primary function of a public science system is to generate reliable knowledge and expertise that informs society, education, and governance, from which innovation can subsequently arise. When discovery science is narrowed or subordinated to predetermined technological outcomes, a nation's ability to understand complex environmental, health, and societal challenges may correspondingly diminish.

Reliable Knowledge at Arm's Length from Political Agencies

Scientific inquiry is most robust when it retains a degree of institutional independence from the ministries responsible for implementing policy. Ministries must balance fiscal constraints, electoral cycles and ministerial direction. Science serves a different purpose: to investigate underlying conditions, identify emerging risks and generate knowledge that may challenge existing policy assumptions.

The phrase 'the science' is sometimes presented as though it were politically neutral. In practice, science is shaped by what it is funded to investigate. When research programmes are not supported to examine environmental exposures, nutritional sufficiency or other determinants of population health that may require regulatory intervention, that absence itself reflects a political choice about which questions are pursued.

For this reason, a durable national science system requires dedicated public funding streams and institutions and institutional independence from the ministries whose policies they may ultimately inform. Independent discovery research can illuminate problems that governments may have little immediate appetite to address, including cumulative environmental pressures, toxic exposures and other environmental drivers of chronic disease.

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[3] Merton, R. K. (1973). The Sociology of Science: Theoretical and Empirical Investigations. Chicago: University of Chicago Press.
[4] Stokes, D. E. (1997). Pasteur's Quadrant: Basic Science and Technological Innovation. Washington, DC: Brookings Institution Press.
[5] Jasanoff, S. (Ed.). (2004). States of Knowledge: The Co-Production of Science and the Social Order. London: Routledge.

Over time, such independence strengthens rather than weakens government. By identifying emerging risks, revisiting historic policy assumptions and testing whether regulatory frameworks remain scientifically defensible, independent research helps institutions avoid path dependency and outdated policy settings. A well-designed science system therefore acts as a long-term corrective mechanism within democratic governance.

New Zealand's science policy over the past decade has emphasised excellence, impact and innovation, as reflected in the National Statement of Science Investment 2015–2025. The system is currently stewarded primarily through the Ministry of Business, Innovation and Employment, whose wider mandate centres on economic development and business innovation. While this orientation has supported industry engagement and technology development, it has also tended to prioritise commercially oriented research pathways over foundational public-good science in areas such as chronic disease causation, environmental toxicology, nutrition, brain health and cumulative environmental exposures.

Recent science-system reforms continue this trajectory. Proposed public research organisations emphasise bioeconomy development, advanced technologies and economic growth. By contrast, there remains no dedicated national institute responsible for investigating the interconnected drivers of chronic illness and environmental degradation, nor a single institution tasked with integrating research on urban wastewater, industrial emissions, agricultural pollutants, groundwater contamination and the cumulative environmental determinants of human health. The absence of such capability represents a concerning gap in the national science system at a time when both chronic disease and environmental pressures are intensifying.

Protecting Human & Environmental Resources to Ensure Future Productivity

Economic productivity ultimately depends on the health and capability of the population and the quality of the knowledge base informing decision-making across both the public and private sectors. Where chronic illness is widespread and the science system does not adequately investigate the underlying drivers of metabolic, neurological, environmental and nutritional health, workforce participation, cognitive capacity and long-term economic performance are inevitably constrained. A well-functioning research, science and technology system therefore supports productivity not only through innovation, but through the generation of public-good knowledge that protects population health and informs responsible economic development.

Globally, the burden of disease has shifted toward chronic conditions. Non-communicable diseases now account for the majority of deaths and are driven by complex interactions between metabolic dysfunction, neurological vulnerability, diet, environmental exposures and social conditions. At the same time, environmental pressures—including declining water quality, pollution and cumulative chemical exposures—pose increasing risks to both ecological and human health systems. These trends underscore the need for sustained interdisciplinary research capable of investigating slow-moving and multifactorial drivers of disease and environmental degradation.

Despite its title, the Institute of Environmental Science and Research (ESR) does not currently function as a comprehensive national centre for human–environmental health research. Its core programmes focus primarily on infectious disease surveillance, outbreak response, forensic science and environmental microbiology. These functions reflect the institute's origins in public health laboratories and biosecurity systems.

However, they leave New Zealand without a dedicated national platform for investigating long-term interactions between environmental exposures, nutrition, metabolic health, neurological development and chronic disease.

[2] NEW ZEALAND HISTORY: PUBLICLY FUNDED RESEARCH AND SCIENCE

> *The most important advances in science frequently arise from research motivated by the desire to understand fundamental phenomena while also addressing practical problems. Stokes, D.E.*

At its core, the public role of research and science is not confined to producing commercial products or near-term innovations. In a constitutional sense, publicly funded research exists to generate knowledge, deepen understanding, build national expertise, and inform public decision-making and education. That broader role is reflected in the Research, Science, and Technology Act 2010, which defined 'outputs' to include knowledge and information and provided that specified research, science and technology funding could be allocated 'for the benefit of New Zealand'. [6]

The Act set out deliberately broad purposes for public research investment, including increasing knowledge or understanding of the physical, biological, or social environment; contributing to economic growth; developing, maintaining, or increasing skills and scientific expertise important to New Zealand; supporting work unlikely to be adequately funded from non-government sources; facilitating research; and promoting the application of research. This framework recognises that the public science system exists partly to create the knowledge base on which education, regulation, environmental management, and future innovation depend.

Allocation of funding

7 Purposes for which specified RS&T funding may be allocated

(1) Specified RS&T funding may be allocated for research, science, or technology, or related activities, for the benefit of New Zealand.

(2) The activities referred to in subsection (1) include (but are not limited to) any activity that—

(a) is likely to increase knowledge or understanding of the physical, biological, or social environment; or

(b) is likely to contribute to New Zealand's economic growth; or

(c) is likely to develop, maintain, or increase skills or scientific or technological expertise that is of particular importance to New Zealand; or

(d) is unlikely to be funded, or adequately funded, from non-governmental sources; or

(e) facilitates research, science, or technology, or related activities; or

(f) promotes or facilitates the application of research, science, or technology, or related activities.

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[6] Research, Science, and Technology Act 2010.
https://www.legislation.govt.nz/act/public/2010/131/en/latest/#096be8ed81a05854.pdf

That is a much wider conception than innovation alone. It recognises that the public science system exists partly to create the knowledge base on which education, regulation, clinical practice, environmental management, and future innovation depend.

That broader public role also has deeper institutional roots in New Zealand. The former Department of Scientific and Industrial Research (DSIR) was established to coordinate scientific activity across the country and maintain national scientific capability in key domains. Its remit extended well beyond the development of marketable technologies. The DSIR assembled laboratories and expertise in areas such as geology, meteorology, agricultural science, biological research, and applied chemistry, building foundational knowledge that informed national policy, education, and production systems. Science was therefore understood as part of the nation's knowledge infrastructure - an institutional capacity to observe, understand, and respond to the evolving condition of human, environmental, and productive systems.[7] [8]

The legislative history immediately before the 2010 Act points in the same direction. Under the Foundation for Research, Science, and Technology Act 1990, the Foundation's functions expressly included allocating funds for 'outputs relating to public good science and technology' and providing independent policy advice on research, science, and technology, including national priorities. The Act required consultation with industry, researchers, Māori, and the wider community, and emphasised that scientific advice should be made readily available to both researchers and the public. In this way, public science institutions were conceived not simply as innovation engines but as mechanisms for strengthening national understanding and supporting informed governance.

The 2010 Act retained much of that breadth, even though it changed the funding architecture.

The implication for public-good research is straightforward. If the lawful purposes of public science funding include increasing understanding of the physical, biological, and social environment, maintaining nationally important expertise, and supporting work that the market will not adequately fund, then public-good research must include monitoring, surveillance, synthesis, foundational discovery science, and basic research into complex system problems.

That includes research whose value lies in making problems visible: degraded soils, polluted waterways, nutritional insufficiency, chronic disease causation, adverse drug effects, environmental toxic exposures, infrastructure failure points, or social conditions affecting health. Such work may not yield a patent, a start-up, or a short-term commercial return. But it is still squarely within the public role of science as envisaged by the statutory framework, because it builds the knowledge, skills, and evidence base on which both education and intelligent national decision-making depend.

Once research and science are understood in their proper public role, education is not a side effect but part of the mission. Publicly funded science expands what can be taught in universities,

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[7] Wikipedia. Department of Scientific and Industrial Research (New Zealand) https://en.wikipedia.org/wiki/Department_of_Scientific_and_Industrial_Research_(New_Zealand)
[8] Te Ara. Department of Scientific and Industrial Research (accessed 09 Mar 2026). https://teara.govt.nz/en/1966/science-and-government/page-2

polytechnics, professional training, and public institutions because it determines what knowledge is available, current, and locally grounded.

A strong public science system therefore strengthens the intellectual capacity of the entire country. Conversely, when the scope of inquiry narrows, the knowledge available to government, professionals, and the public also narrows. In such circumstances the range of questions that can be asked, and the evidence available to answer them, contracts, affecting what government can know, what professionals can teach, and what the public can reasonably understand about the condition of New Zealand's human, environmental, and productive systems.

Against this historical and intellectual background, the decision in 2013–2014 to place stewardship of the research and science system within the Ministry of Business, Innovation and Employment, through administrative and secondary legislative changes rather than through a dedicated research statute, raises an important institutional question.

The consolidation occurred with limited public consultation and without an explicit parliamentary debate about the long-term implications of embedding science policy within an economic ministry whose primary mandate is business development and innovation.

When considered against both the historic role of science in New Zealand and the classical foundations of the public role of science described by Bush, Polanyi, Merton, Stokes and Jasanoff, it is reasonable to ask whether this institutional arrangement continues to serve the broader purposes for which public science systems were established.

The experience of the past decade suggests that the placement of science stewardship within an innovation-focused economic ministry may have contributed to a partial decoupling of the science system from its traditional role as a generator of public knowledge and national intelligence, with research incentives increasingly oriented toward innovation outcomes rather than toward the sustained production of knowledge required to understand and steward the country's human, environmental, and productive systems.

[3] TIMELINE: NEW ZEALAND'S RESEARCH AND SCIENCE FRAMEWORK

Late 1990s-mid 2000s: Innovation is related to economic growth, and the extent of patent production tied to economic growth. Innovations are viewed as a patent pathway.[9] [10]

Crown Research Institutes Act 1992. Provides for the formation of Crown-owned companies to undertake scientific research and other related activities as CRIs. The principles of operation were that they were undertaken for the benefit of New Zealand and that they should pursue excellence in all activities. 'Innovation' was not referred to in this Act. This Act enabled the Institute of Environmental Science and Research to be established mid-1992.[11]

Companies Act 1993. This converted all CRIs into limited liability companies. It operates as a Crown Company Unit of the Ministry of Finance and the Minister responsible for Research,

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[9] OECD. (2005). The Measurement of Scientific and Technological Activities, Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd edition,. A joint publication of OECD and Eurostat.
[10] Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and 'Mode 2'' to a Triple Helix of university–industry–government relations. Research Policy, 109-123.
[11] Institute of Environmental Science and Research https://en.wikipedia.org/wiki/Institute_of_Environmental_Science_and_Research

Science and Technology. Both responsible ministers are also always registered as shareholders of the eight Crown Research Institutes.

Foundation for Research, Science and Technology (FRST) established and later placed inside the Ministry of Research, Science and Technology (MoRST).[12]

2010, August: State Sector (Ministry of Science and Innovation) Order 2010. Came into force November 1, 2010. It stated: Schedule 1 of the State Sector Act 1988 is amended by inserting the following item in its appropriate alphabetical order: "Ministry of Science and Innovation".[13]

2010: Research, Science, and Technology Act 2010 was passed. Date of Assent December 20, 2010. It was administered by the Ministry of Science and Innovation. It commenced February 1, 2011, repealing the FRST, allowed for the establishment of boards to make independent funding decisions for the purposes of research, science, or technology, or related activities and provided for the transfer of employees, assets, and liabilities from the Foundation for Research, Science, and Technology to a new department of State. 'Innovation' was not referred to in this Act.[14]

2012, May: MBIE was formed using secondary legislation. It was proposed by the Hon Stephen Joyce, the Minister for Economic Development. This Order in Council merged four government agencies, the Ministry of Economic Development, the Department of Labour, the Ministry of Science and Innovation, and the Department of Building and Housing. It was enabled under the State Sector Act 1988.[15]

This Order did not include any purpose or function for the new Ministry of Business, Innovation and Employment, which is unique for a Ministry.

2015: National Statement of Science Investment 2015-2025. Ministry of Business, Innovation and Employment.[16] This was published following public feedback in 2014. The funding for research would be then prioritise funding applications stressing 'impact' and excellence' and 'innovation'. 'Innovation' was mentioned 100+ times in the National Statement.

[4] HUMAN HEALTH INSTITUTIONS DEFUNDED & DISMANTLED

Over the past two decades, New Zealand's health research funding has largely been channelled through the Health Research Council (HRC) together with broader science-system funds administered through the Ministry of Business, Innovation and Employment (MBIE). The HRC, established under the Health Research Council Act 1990, has functioned as the government's

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[12] Foundation for Research, Science, and Technology Act 1990
https://www.legislation.govt.nz/act/public/1990/72/en/latest/
[13] Order in Council. State Sector (Ministry of Science and Innovation) Order 2010
https://legislation.govt.nz/regulation/public/2010/0247/6.0/whole.html
(revoked, on 7 August 2020, by section 134 of the Public Service Act 2020 (2020 No 40))
[14] Research, Science, and Technology Act 2010.
https://www.legislation.govt.nz/act/public/2010/131/en/latest/#096be8ed81a05854.pdf
[15] State Sector (Ministry of Business, Innovation, and Employment) Order 2012.
https://www.legislation.govt.nz/regulation/public/2012/0091/9.0/whole.html
State Sector (Ministry of Business, Innovation, and Employment) Order 2012: revoked, on 7 August 2020, by section 134 of the Public Service Act 2020 (2020 No 40).
[16] National Statement of Science Investment 2015-2025. Ministry of Business, Innovation and Employment.
https://www.mbie.govt.nz/science-and-technology/science-and-innovation/funding-information-and-opportunities/national-statement-of-science-investment

principal investor in health research and typically manages hundreds of active research contracts at any given time across biomedical, clinical, population health and health-services research.

Distributed and collaborative research model

The design of funded programmes across the science, research and technology fields has deliberately encouraged a distributed research model. Rather than establishing large permanent national institutes, most funding is allocated through competitive grants to investigators hosted in universities, Crown Research Institutes, district health services and independent research organisations. Projects are commonly led by one institution but involve collaboration across several universities and research groups.

This distributed approach has several advantages. It supports a wide national research workforce, encourages interdisciplinary collaboration, and allows teams from different institutions to combine expertise on specific projects. Large programmes funded through mechanisms such as Centres of Research Excellence, National Science Challenges, or major HRC grants often involve multi-institution networks spanning universities, hospitals, and research institutes working together on defined research questions.

This funding architecture has produced a capable but fragmented research landscape. Most programmes are organised as time-limited competitive projects led by universities and research institutes collaborating across multiple institutions.

Health Research has Pivoted to Reflect the Innovation Scope

As New Zealand's science policy increasingly emphasised innovation, economic impact and commercialisation as primary goals of the research system, health research policy adjusted to explicitly align HRC investments with the wider science and innovation system, including economic and technological objectives overseen by MBIE. Although publicly funded health research is delivered through competitive grants administered by the Health Research Council and MBIE, HRC's perspective shifted to align with the innovation focus.

This orientation has encouraged strong engagement between health research, genetics and biotechnology, pharmaceutical development, and clinical innovation. It has resulted in funding scopes designed to fund projects with identifiable outputs, technological applications or near-term impacts.

Consequences for integrative chronic-disease research

Within this funding environment, large-scale integrative research into chronic disease systems has remained comparatively under-resourced. Chronic conditions such as metabolic disease, neurodevelopmental disorders, environmental toxic exposures and nutritional insufficiency arise from complex interactions across biological, environmental and social systems over long timeframes. Investigating these drivers requires stable multidisciplinary research capability sustained over decades.

Instead, research on environmental contaminants, metabolic regulation, nutrition and cumulative exposures is often dispersed across smaller academic projects rather than coordinated through a single national institute with a long-term mandate. The result is a capable but fragmented research landscape, with relatively few permanent national platforms dedicated to investigating the long-horizon determinants of population health.

MBIE's Science Policy Consequences: Defunding and Dismantling of Public Research

The experience of several New Zealand research institutions illustrates the vulnerability of long-horizon public-interest science when funding systems do not protect long-term research capability for public-good monitoring, research and science.

Gravida, National Centre for Growth and Development was established as a Centre of Research Excellence was established in 2003 to investigate the developmental origins of health and disease, including how early-life nutrition, environmental exposures and metabolic regulation shape lifelong health outcomes. Its work directly addressed issues such as metabolic disease risk, maternal nutrition, and early developmental vulnerability, precisely the kinds of slow-moving biological processes that require sustained, interdisciplinary investigation.

Despite producing internationally recognised research, Gravida's long-term institutional footing remained dependent on periodic funding rounds, primarily the government-funded Centre of Research Excellence (CoRE) funded through the Tertiary Education Commission on six-year competitive funding cycles. Gravida was not dismantled through legislation but through the withdrawal of national funding, which illustrates the vulnerability of long-horizon research programmes when funding is tied to periodic competitive cycles.

A similar pattern can be seen with the Centre for Public Health Research at Massey University (CPHR) established in 2000. CPHR has provided expertise on environmental health risks, radiation exposure, occupational health, toxicology and community health determinants, producing important public-good information. Its research addressed issues such as environmental contaminants, risk assessment and public-health surveillance, areas that rarely generate commercial returns but are central to protecting population health.

CPHR two decades but lost major programme-level funding and institutional support during restructuring of public-health research capacity in the early 2020s, with staff dispersed across other programmes and research groups. The centre's closure following the loss of sustained funding reflects a broader institutional problem: research capacity that serves long-term public health functions is vulnerable when funding systems prioritise short-term project outputs or commercially oriented research pathways.

The situation surrounding the Health Research Council (HRC), established in 1990 under the Health Research Council Act 1990 as a Crown entity responsible for managing government investment in health research, further illustrates the institutional instability of public-interest health research.

For decades the HRC functioned as New Zealand's primary public funding body for biomedical and public-health research. However, recent science-system reforms propose absorbing its functions into a wider national research funding framework. While system integration may bring administrative efficiencies, the loss of a dedicated statutory body focused specifically on health research raises questions about whether long-term investigations into environmental determinants of health, nutrition science, toxic exposures and chronic disease causation will retain sufficient priority within a broader innovation-driven funding architecture.

Research into biological contaminants, nutrient sufficiency, environmental exposures and chronic disease causation requires long time horizons, interdisciplinary collaboration and stable institutional support. Yet these areas frequently struggle to secure sustained funding because they do not align neatly with commercial innovation agendas or short funding cycles.

This pattern strengthens the case for establishing a dedicated Institute for Human and Environmental Health Research, with a statutory mandate and stable public funding to undertake long-horizon interdisciplinary research into the biological, environmental and social determinants of health. Such an institute would provide sustained national capability in areas including:

i. metabolic disease and metabolic regulation
ii. neurodevelopmental vulnerability and brain health
iii. psychiatric and mental health determinants
iv. nutrition science and nutrient adequacy
v. endocrine disruption and chemical exposures
vi. cumulative toxic exposures and chemical mixtures
vii. urban wastewater and industrial emissions
viii. agricultural pollutants and environmental contaminants
ix. groundwater, drinking water and ecosystem health
x. long-term environmental determinants of disease.

An institute of this kind would function as a national research platform capable of sustained multidisciplinary inquiry into slow-moving and cumulative drivers of disease and environmental degradation. By providing protected institutional capability and ring-fenced funding, it would address the recurring problem evident in the experiences of Gravida, the Centre for Public Health Research and other public-interest research programmes: that the scientific investigation of long-term health and environmental risks often lacks the political and financial stability required to fulfil its public-health mandate.

[5] THE INSTITUTE OF ENVIRONMENTAL SCIENCE AND RESEARCH (ESR)

ESR emerged from Cabinet-level science reforms (1989–1992) that dismantled the DSIR and reorganised government science into sector-based institutes. These reforms culminated in the creation of ten Crown Research Institutes on 1 July 1992.

ESR's purpose is typically expressed as:

> *'to deliver enhanced scientific and research services to the public health, food safety, security and justice systems, and the environmental sector'.*

Within New Zealand's science system, the human-health component of ESR's Human and Environmental Health platform has historically been oriented toward infectious disease and acute public-health protection, rather than toward chronic disease causation. ESR's core functions sit within the operational infrastructure of the public-health system and include infectious disease surveillance, outbreak investigation, pathogen genomics, antimicrobial resistance monitoring, and microbiological assessment of water and food safety. These roles are closely tied to national public-health protection functions such as reference laboratories, notifiable disease surveillance, wastewater epidemiology, and environmental microbiology. As a result, the "human health" dimension of ESR's research portfolio has typically been interpreted through the lens of biological hazards, communicable disease, and environmental pathogens, rather than broader determinants of long-term health.

By contrast, research into chronic illness and its environmental or nutritional determinants has not been a central focus of ESR's mandate. Areas such as metabolic disease, neurodevelopment and brain health, nutrition science, endocrine disruption, chemical exposures, and other environmental contributors to chronic disease tend to sit elsewhere in the research system, primarily within university programmes funded through the Health Research Council or other contestable mechanisms. New Zealand does not have a large national institute dedicated to chronic disease causation or environmental determinants of long-term health, and responsibility for these topics is therefore dispersed across smaller research groups and agencies. Even within environmental health research, ESR's work has largely concentrated on microbial contamination and pathogen transmission, rather than on chronic toxicological exposures such as pesticides, endocrine-disrupting chemicals, air pollution, or cumulative environmental stressors.

This distribution of research capability reflects the historical architecture of the science system created in the early 1990s. When the Department of Scientific and Industrial Research (DSIR) was restructured and Crown Research Institutes were created under the Crown Research Institutes Act 1992, ESR inherited functions primarily related to public-health microbiology and communicable disease surveillance. The institutional design therefore prioritised scientific capacity for outbreak detection and biosecurity threats.

While the frameworks built in capacity for infectious disease surveillance and emergency response, monitoring, research and science to unpack chronic disease drivers, particularly those arising from environmental exposures, poor nutrition, and long-term system interactions, have never been consolidated within a single national research mandate and funded over a period of decades, leaving a notable gap between the dominant burden of chronic illness and the focus of publicly organised health science capability.

The national institute responsible for public health science operates with an annual budget of roughly NZ$140 million.[17] However, the majority of this funding supports infectious disease surveillance, forensic science and laboratory services rather than sustained research into chronic disease causation or environmental determinants of health.

In July 2025, the Institute of Environmental Science and Research (ESR) changed its name to the New Zealand Institute for Public Health and Forensic Science (PHF Science). Sir Ashley Bloomfield is the chief executive.

> *In November 2025, the Government announced that the Infectious Diseases Research Platform (formerly Te Niwha), will oversee $75 million of investment over seven and a half years to boost New Zealand's resilience to infectious diseases and pandemic preparedness.*

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[17] ESR Annual Report 2024–25 Institute of Environmental Science and Research Limited. https://www.phfscience.nz/media/1f0eyvlk/esr-annual-report-2024-25.pdf?

The Platform will be hosted by the New Zealand Institute for Public Health and Forensic Science (PHF Science) on behalf of the New Zealand Government, formerly the Institute of Environmental Science and Research (ESR).[18]

The ESR does not have a broad remit to understand human and environmental pressures, and there are no observed two-way feedback loops between the ESR and the Environmental Protection Authority (NZ EPA). The NZ EPA has largely stepped away from recognising the relationship between New Zealand exposures and human and environmental health risks and has largely stepped away from undertaking form risk assessment. Most of its decisions, including reassessment decisions are based on modelling and hypothetical scenarios, often supplied by the chemical industry applicant.

Professor David Michaels articulated the importance of an integrative knowledge-based system, that can draw attention to pollutant stressors, and act decisively to deal with them:

> 'Our regulatory system is the response to these market failures. The objectives of the laws and the agencies empowered to enforce them is not only to stop the damage and prevent future harm; it is to maintain and strengthen the free market system. Law and regulation are the underpinnings of our economic system.
>
> ...Without the regulatory apparatus of the state, our modern economy could not exist.'[19]

[6] THE MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT (MBIE)

The Ministry of Business, Innovation and Employment (MBIE) is a government department rather than a statutory body with a single dedicated founding Act setting out a clear research-policy mandate. Instead, it was created in 2012 through an administrative merger of several departments (including the Ministry of Science and Innovation, the Ministry of Economic Development, and the Department of Labour). As a result, MBIE's purpose and operating principles are not codified in a specific piece of overarching legislation governing science policy. Rather, its authority derives from the general machinery of government statutes such as the State Sector Act 1988 (now largely replaced by the Public Service Act 2020) and the Public Finance Act 1989, which define the responsibilities of public service departments and the management of public expenditure.

Within that administrative framework, MBIE has adopted an institutional mission centred on economic performance. Its published vision is to "grow New Zealand for all", with core objectives focused on improving productivity, supporting business innovation, strengthening labour markets, and enabling economic growth.

Science and research policy therefore sits within a broader portfolio that includes economic development, industry policy, immigration, energy and resources, and employment regulation. In practice, this institutional configuration means that MBIE's stewardship of the research and innovation system is closely tied to its wider mandate to support economic growth and innovation-led productivity.

This orientation has implications for the design of science policy. Because MBIE's organisational priorities revolve around economic and growth outcomes, its science-investment frameworks

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[18] Infectious Diseases Research Platform – Te Niwha. (Accessed March 9, 2026). https://www.teniwha.com/
[19] Dr. David Michaels is an epidemiologist and professor at George Washington University. From 2009 to 2017 as the administrator of the Occupational Safety and Health Administration (OSHA), USA.

have prioritised innovation, commercialisation pathways, and measurable economic or technological impact.

In such a social, and political culture, funding mechanisms and research priorities directly align with MBIE's institutional interests. This had made it more difficult for areas of science whose benefits are long-term, diffuse, or primarily public-health oriented (such as chronic disease causation, nutrition science, or environmental determinants of health) to secure sustained strategic attention.

[7] NATIONAL STATEMENT OF SCIENCE (2015-2025)

The National Statement of Science Investment 2015–2025 (NSSI) established a clear strategic framing for New Zealand's public science system built around the twin pillars of 'excellence' and 'impact'. The Government's vision was for "a highly dynamic science system" in which publicly funded research would make a 'visible, measurable contribution to productivity and well-being through excellent science'.

In this framework, excellence refers to the quality of scientific work and the people producing it, while impact refers to the ways research generates demonstrable benefits for the economy, environment, health and society. Over time the policy architecture associated with the NSSI increasingly linked these concepts to innovation, economic productivity, and measurable outcomes. This has, and continues to, shape how funding programmes and research priorities are formulated and the resulting funding scopes for the researchers and scientists.

While the emphasis on excellence and impact aims to ensure public value from science investment, it also creates a structural tension for curiosity-driven, knowledge-generating basic research, particularly in fields where pathways to measurable impact are long, diffuse, or uncertain. Much of the investment architecture that developed under the NSSI, including contestable funding rounds and mission-oriented programmes, place significant weight on demonstrating pathways to benefit or societal impact.

Governments internationally have increasingly required science systems to show tangible outcomes from public investment, and New Zealand has followed this trend, emphasising results chains linking research inputs to measurable outcomes and impacts. Within such an environment, research topics that produce incremental knowledge about complex biological systems or slow-moving environmental determinants of disease may struggle to compete with projects that can more readily demonstrate technological innovation, economic productivity, or near-term policy applications.

This dynamic is particularly relevant for areas such as metabolic disease (diabetes and obesity), neurodegenerative disease, nutrition science, psychiatric and brain health research, endocrine disruption, chronic toxic exposures, and the long-term environmental determinants of disease. These fields often require long-horizon, foundational basic research, large interdisciplinary datasets, and decades-scale accumulation of mechanistic understanding before translational benefits become clear. For example, research into metabolic regulation, neurodevelopmental vulnerability, endocrine signalling disruption, or cumulative toxic exposures typically advances through incremental advances in physiology, epidemiology, toxicology and systems biology rather than through rapid innovation cycles. In a science investment framework that emphasises demonstrable impact and innovation pathways which prioritise commercial or technological translation, such knowledge-building research can become comparatively disadvantaged.

The challenge is amplified where ring-fenced funding streams for fundamental research in these domains do not exist. Without protected funding for investigator-driven discovery science in areas of chronic disease causation and environmental health, research groups must compete in general funding pools where proposals are evaluated partly on their ability to articulate clear pathways to economic, technological, or near-term societal impact.

This can funnel science funding and investment toward fields where innovation and commercialisation pathways are easier to specify - such as biotechnology platforms, digital technologies, or mission-driven programmes, while leaving foundational biological and environmental health questions under-investigated.

In effect, the NSSI framework's emphasis on excellence combined with demonstrable impact can encourage a science portfolio oriented toward innovation-driven outcomes, particularly where funding mechanisms translate these policy signals into assessment criteria. This does not exclude basic research entirely, but it does mean that long-term discovery science in complex health domains may be more vulnerable to under-investment unless it is explicitly protected.

The National Statement of Science Investment 2015–2025, the emphasis on excellence, measurable impact, and innovation-led outcomes has also shaped the types of research programmes that tend to be funded and sustained within the New Zealand science system. Research into complex biological and environmental drivers of chronic illness - such as metabolic regulation, neurodevelopmental vulnerability, endocrine signalling disruption, and cumulative toxic exposures, is comparatively rare within the national research portfolio.

Where such work does occur it is often short-term, project-based, and framed around innovation or translational outputs, rather than supported as long-horizon discovery research and science designed to build foundational understanding of disease causation. These topics frequently require interdisciplinary investigation across physiology, toxicology, epidemiology, environmental science, and systems biology, and they typically produce incremental knowledge over extended timeframes rather than immediate commercial or technological outcomes. Within a funding environment that prioritises demonstrable impact and innovation pathways and commercial translation, such research can therefore struggle to establish sustained programmes.

The consequence is that New Zealand has relatively few researchers with broad, integrated basic-science capability in these domains, particularly in areas linking environmental exposures, metabolic pathways, and long-term neurological or systemic health outcomes. Much of the expertise that does exist is distributed across small university groups or short-term projects rather than embedded within stable national research platforms.

The pattern is visible in the published literature, where New Zealand contributions to research on endocrine disruption, chronic toxicology, environmental determinants of metabolic disease, and related systems-biology questions remain comparatively limited relative to other developed research systems. In effect, the combination of strategic funding priorities, short project cycles, and the absence of dedicated long-term research platforms has constrained the development of a broad domestic scientific capability to investigate these drivers of chronic disease and environmental health risk.

[8] 2024-2025 SCIENCE SYSTEM REFORM ARCHITECTURE

The 2024–2025 science-system reform framework does retain a formal place for curiosity-driven basic research, but that space remains broad and largely unstructured. For fields such as chronic metabolic disease, neurodegeneration, nutrition science, environmental toxicology and the wider environmental determinants of health, the absence of clearly identified ring-fenced funding streams risks leaving significant knowledge gaps unresolved, even as the national disease burden increasingly shifts toward chronic and environmentally mediated conditions.

MBIE's new funding strategy states that the future system will sit under four broad pillars: economy, advanced technology, environment, and health and society, and that 'discovery-led science and research will continue to be funded', including beyond these pillars. However, the same documentation notes that the current designs are indicative, with detailed priorities and allocations to be determined through the *Science Investment Plan* and associated *Pillar Investment Plans*.

While this preserves a conceptual space for discovery research, the framework does not yet identify topic-specific ring-fenced funding for areas such as metabolic disease, neurodegeneration, nutrition, psychiatric or brain health, endocrine disruption, chronic toxic exposures, or long-term environmental drivers of disease, and, within the current trajectory, is unlikely to. [20]

The most visible existing mechanism for investigator-driven discovery research remains the Marsden Fund. The Marsden Fund's Terms of Reference state that it supports excellent, investigator-led research aimed at generating new knowledge and encourages exploration of ideas that may not be funded elsewhere.

However, during the 2024–2025 reform period the framing of Marsden has also shifted toward 'science with a purpose', with explicit reference to long-term economic, environmental or health benefit and ministerial responsibility for the fund's terms and investment plan. As a result, while Marsden continues to function as a discovery mechanism, it is no longer framed as entirely independent of strategic utility and does not constitute a clear ring-fenced basic-research envelope for neglected chronic-disease or environmental-health domains.[21] [22]

The statement that the Marsden Fund 'encourages New Zealand's leading researchers to explore new ideas that may not be funded through other funding streams and fosters creativity and innovation within the science, innovation and technology system' reflects its role as the principal mechanism for investigator-initiated discovery research.

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[20] MBIE. A new funding strategy for the science system. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/refocusing-the-science-innovation-and-technology-system/a-new-funding-strategy-for-the-science-system

[21] Terms of Reference for the Marsden Fund

[22] New Zealand Gazette. Funding Decisions for the 2026 Marsden Fund Round. https://gazette.govt.nz/notice/id/2025-go6842?

Yet this formulation also reveals an important limitation: the fund supports novel ideas proposed by individual researchers, rather than systematically addressing identified national knowledge gaps. It is not designed to query whether foundational scientific capability is missing in domains such as chronic disease causation, metabolic regulation, nutrition science, psychiatric or brain health, endocrine disruption, chronic toxic exposure, or long-term environmental drivers of disease.

Because Marsden emphasises creativity, novelty and investigator-driven innovation, rather than the deliberate development of strategic knowledge platforms in under-researched fields, it does not necessarily ensure sustained research attention to complex public-health challenges. Areas requiring long-horizon, cumulative basic research programmes, particularly those that do not readily produce technological innovation or commercialisable outcomes, have historically struggled to gain traction under such a model. The system can therefore foster intellectual novelty while still leaving broad knowledge gaps across interdisciplinary domains that require coordinated, long-term scientific capability rather than short project cycles.

The reform trajectory also centralises priority-setting, further weakening the case for assuming protected topic-specific discovery funding unless it is explicitly established. The Te Ara Paerangi framework proposed National Research Priorities as the mechanism through which government would direct research, science and innovation resources toward key challenges and opportunities. Under the new architecture, funding decisions are organised through a Science Investment Plan, advised by the Prime Minister's Science, Innovation and Technology Advisory Council, with Research Funding New Zealand overseeing Pillar Investment Plans and replacing most existing decision-making bodies, including the Marsden Fund Council and the Health Research Council.[23] [24] [25]

While the new framework may improve strategic coordination, it does not, in currently published documents, guarantee a protected pool for curiosity-driven basic research across neglected health domains.

This omission becomes particularly visible in the mandates of the new public research organisations. The New Zealand Institute for Public Health and Forensic Science, effectively a refocused ESR, is described by MBIE as concentrating on disease detection and response together with forensic science. This mandate is operational and surveillance-oriented.[26]

It does not describe a broad institute for chronic disease causation, nor does it reference nutrition science, metabolic dysfunction, neurodegeneration, psychiatric research, endocrine disruption, chronic toxicology, or environmental drivers of long-term illness. If one asks where, within the new institutional architecture, a protected basic-research base for those topics sits, the answer is not clearly within this organisation.

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[23] MBIE (2022). Te Ara Paerangi Future Pathways White Paper 2022. https://www.mbie.govt.nz/assets/te-ara-paerangi-future-pathways-white-paper-2022.pdf

[24] MBIE (July 2023). Te Ara Paerangi – Future Pathways: National Research Priorities. https://www.mbie.govt.nz/assets/te-ara-paerangi-future-patherways-national-research-priorities-proactiverelease.pdf

[25] MBIE (Jan 2026). Research Funding New Zealand. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/refocusing-the-science-innovation-and-technology-system/research-funding-new-zealand

[26] MBIE (Dec 2025). Public Research Organisations. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/agencies-policies-and-budget-initiatives/research-organisations/public-research-organisations

The other new public research organisations do not obviously fill this gap. The *Bioeconomy Science Institute* is framed around agriculture, aquaculture, forestry, biotechnology, manufacturing, ecosystems, biosecurity threats and climate risks, while the *Earth Science Institute* focuses on energy security, natural resources, sustainability, and resilience to hazards and climate impacts.

Although these institutional scopes may intersect with environmental determinants of health in principle, they are not described as long-horizon, basic-science institutes for human chronic disease causation, environmental epidemiology, or chemical exposure science. Their public descriptions emphasise economic growth, resource management and resilience rather than slow-moving health causation research.

On the health-research side the picture is somewhat mixed. The Health Research Council's *2025–2026 Statement of Performance Expectations*[27] continues to support investigator-initiated research across biomedical, clinical, health services and public-health fields, noting that the council balances immediate impact with exploration generating future gains. This suggests some continuing space for curiosity-driven health research.

However, these funds are not ring-fenced for historically under-funded domains such as environmental drivers of metabolic disease, neurodevelopmental vulnerability, nutrition science, endocrine disruption or cumulative chemical exposures. Moreover, under the reforms the HRC is being disestablished, with its funding functions moving to *Research Funding New Zealand* and its policy roles redistributed elsewhere. The previously distinct health-research funding channel is therefore being absorbed into a broader strategic apparatus rather than strengthened as a protected basic-research stream.

In short, when the narrower question of ring-fenced public-good funding for human chronic disease causation, nutrition science, environmental epidemiology or endocrine-disrupting chemical exposures is examined, the answer remains largely negative. The *Science System Advisory Group* recommended that a portion of the research budget be allocated for basic research and knowledge development in every domain.[28] However, this recommendation has not yet been implemented as a formal funding ring-fence in the published investment framework. MBIE's funding strategy refers to discovery-led research continuing, but it does not specify topic-based discovery funding for chronic disease, psychiatric and brain health, nutrition science, endocrine disruption or chronic toxic exposures.

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[27] HRC (2025). Statement of Performance Expectations 2025/26. https://www.hrc.govt.nz/sites/default/files/2025-07/HRC%20Statement%20of%20Performance%20Expectations%202025-2026.pdf
[28] SSAG (Aug 2024). Science System Advisory Group Report An architecture for the future August 2024. https://www.mbie.govt.nz/assets/science-system-advisory-group-report.pdf

By contrast, where the Government has sought a clearly defined national capability it has done so explicitly, for example, through the $75 million Infectious Diseases Research Platform (IDRP) announced in 2025. [29] [30]

That contrast is significant. Infectious disease now has a clearly identified national research platform, while chronic disease causation and environmental health determinants do not appear to have an equivalent publicly defined programme within the reform framework. The new system therefore preserves discovery research in principle, primarily through the Marsden Fund and cross-cutting discovery mechanisms, yet there is no clear evidence of dedicated, ring-fenced funding streams for foundational research in metabolic disease, neurodegeneration, nutrition science, psychiatric or brain health, endocrine disruption, chronic toxic exposures or long-term environmental determinants of disease. [31] [32]

Overall, the reforms are much clearer about priority-setting, consolidation, strategic alignment, public-health response, advanced technologies and economic impact than they are about protecting the long-horizon discovery science needed to understand the complex drivers of chronic disease and environmental health.

[9] THE GREATER DISEASE BURDEN: FROM INFECTIOUS OR CHRONIC DISEASE?

Over the past 20 years, chronic disease has been the larger killer globally, by a wide margin.

WHO Findings

Using WHO's broad cause groups, non-communicable diseases (NCDs) accounted for 59.5% of all global deaths in 2000 and rose to 73.9% in 2019. Communicable, maternal, neonatal and nutritional causes fell from 32.2% in 2000 to 18.2% in 2019. COVID then temporarily pushed infectious/communicable mortality back up, but even in 2021 NCDs still accounted for 65.3% of all deaths, compared with 28.1% from communicable causes. On that basic comparison, chronic disease has been greater throughout the whole period, and the gap widened markedly before the pandemic shock.[33] [34] [35]

In absolute terms, WHO reports that noncommunicable diseases killed at least 43 million people in 2021. That is the dominant mortality block globally, even after the COVID surge. WHO also notes that 18 million people died from NCDs before age 70 in 2021, and that this premature NCD toll

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[29] MBIE. A new funding strategy for the science system. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/refocusing-the-science-innovation-and-technology-system/a-new-funding-strategy-for-the-science-system
[30] MBIE (Nov 2025). Government invests in Infectious Diseases Research Platform. https://www.mbie.govt.nz/about/news/government-invests-in-infectious-diseases-research-platform
[31] MBIE (Dec 2025). Public Research Organisations. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/agencies-policies-and-budget-initiatives/research-organisations/public-research-organisations
[32] MBIE. A new funding strategy for the science system. https://www.mbie.govt.nz/science-and-technology/science-and-innovation/refocusing-the-science-innovation-and-technology-system/a-new-funding-strategy-for-the-science-system
[33] WHO (2024). World health statistics 2024: monitoring health for the SDGs, Sustainable Development Goals https://iris.who.int/server/api/core/bitstreams/74b12494-f213-4b5b-9533-18442147e1fb/content?
[34] WHO (2026). Global Health Estimates. https://www.who.int/data/global-health-estimates?
[35] WHO (2021). Global health estimates: Leading causes of DALYs. Disease burden, 2000–2021. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys?

was greater than all injuries, infections including COVID-19, and maternal and nutritional causes combined.[36]

The split understates the chronic side, because many of the major metabolic, environmental, and mental-health-related drivers feed into deaths that are ultimately coded as cardiovascular disease, stroke, diabetes, cancer, respiratory disease, kidney disease, or injury. For example, WHO says higher-than-optimal BMI caused an estimated 3.7 million deaths in 2021, while IHME reports air pollution accounted for 8.1 million deaths globally in 2021. Suicide caused about 727,000 deaths in 2021, but mental ill-health also contributes indirectly to mortality through substance use, self-harm, cardiometabolic disease, and poorer outcomes in other illnesses, which means direct death coding understates its total role. These driver categories overlap, so they cannot simply be added together, but they reinforce the same point: the global burden has shifted strongly toward chronic, multifactorial disease.[37] [38] [39]

The Broader Scientific Literature

A growing body of peer-reviewed literature indicates that environmentally mediated factors, including diet, nutrient deficiencies, pollution, and chemical exposures, constitute a major share of the global disease burden. Large comparative analyses show that dietary risk alone is responsible for a substantial proportion of chronic disease mortality. For example, Afshin et al. estimated that suboptimal diet accounted for approximately 11 million deaths globally in 2017, making it one of the largest modifiable contributors to disease worldwide.[40]

Similarly, global analyses of micronutrient intake indicate that billions of people experience inadequate intake of essential nutrients, including iron, zinc, calcium and vitamin E, with implications for immune function, neurodevelopment and long-term disease risk.[41] These findings reinforce the role of dietary quality and nutrient adequacy as foundational determinants of metabolic health and chronic disease.

Environmental exposures beyond diet also represent a major health burden. Fuller et al. report that pollution contributes to roughly nine million premature deaths annually, primarily through cardiovascular disease, respiratory illness and toxic exposures.[42] Reviews of the environmental burden of disease emphasise that existing estimates likely capture only a portion of

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[36] WHO (Sept 2025). Noncommunicable diseases. https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases?
[37] WHO (Dec 2025). Obesity and overweight. https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight?
[38] IHME (June 2024). Air pollution. https://www.healthdata.org/news-events/newsroom/news-releases/air-pollution-accounted-81-million-deaths-globally-2021-becoming?
[39] WHO (May 2025). Suicide worldwide in 2021: global health estimates. https://www.who.int/publications/i/item/9789240110069?
[40] GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2019 May 11;393(10184):1958-1972. doi: 10.1016/S0140-6736(19)30041-8.
[41] Passarelli S, Free CM, Shepon A, Beal T, Batis C, Golden CD. Global estimation of dietary micronutrient inadequacies: a modelling analysis. Lancet Glob Health. 2024 Oct;12(10):e1590-e1599. doi: 10.1016/S2214-109X(24)00276-6.
[42] Fuller R, Landrigan PJ, Balakrishnan K et al. Pollution and health: a progress update. The Lancet Planetary Health, Volume 6, Issue 6, e535 - e547

environmentally mediated risk, as many exposures, particularly endocrine-disrupting chemicals, neurotoxicants and complex chemical mixtures, remain poorly quantified in global burden.[43] As a result, current burden estimates are widely regarded as conservative.

The potential scale of chemically mediated disease has been explored in a series of influential analyses led by Philippe Trasande and colleagues, which focused on endocrine-disrupting chemicals (EDCs). Using epidemiological exposure–response relationships and economic modelling, Trasande et al. estimated that EDC exposures may contribute substantially to disease and dysfunction, primarily through neurodevelopmental impairment, metabolic disease and reproductive disorders. For example, one conservative European analysis estimated that EDC exposures could account for €157 billion in annual health-related costs annually, largely associated with neurodevelopmental effects such as IQ loss and neurodevelopmental disorders.[44] Subsequent modelling suggested that the disease costs of EDCs were much higher in the USA than in Europe ($340 billion [2·33% of GDP] vs $217 billion [1·28%]), again dominated by neurodevelopmental outcomes linked to chemical exposures.[45] These analyses highlight the potential magnitude of chronic disease burdens arising from low-dose environmental chemical exposures, even where causal pathways remain incompletely characterised.

Taken together, this literature suggests that dietary risks, nutrient deficiencies, pollution, and endocrine-disrupting chemical exposures represent major drivers of chronic disease globally, often operating through metabolic, neurological and developmental pathways. At the same time, several reviews emphasise that the scientific understanding of these relationships remains incomplete, particularly for cumulative exposures, chemical mixtures, and long-term environmental determinants of disease. Consequently, many researchers argue that the current estimates likely understate the true burden of environmentally mediated illness, underscoring the importance of sustained basic research to better understand these complex drivers of health and disease.

The human and economic burden of environmentally mediated chronic disease has exceeded that of infectious disease for decades and continues to increase. with multiple comorbid conditions more prevalent than a single condition, and multimorbidity impacting low-income populations a decade earlier than in higher income groups.[46] [47] [48] Although the cost of multimorbidity is 'super-additive'[49] the Ministry of Health does not evaluate the cumulative cost of pharmaceuticals (when two or more a dispensed) by age and gender, to analyse whether other more protective and

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[43] Shaffer RM, Sellers SP, Baker MG *et al*. Improving and Expanding Estimates of the Global Burden of Disease Due to Environmental Health Risk Factors. Environ Health Perspect. 2019 Oct;127(10):105001. doi: 10.1289/EHP5496.
[44] Trasande L, Zoeller RT, Hass U *et al*. Estimating burden and disease costs of exposure to endocrine-disrupting chemicals in the European union. J Clin Endocrinol Metab. 2015 Apr;100(4):1245-55. doi: 10.1210/jc.2014-4324.
[45] Attina TM, Hauser R, Sathyanarayana S, *et al*. Exposure to endocrine-disrupting chemicals in the USA: a population-based disease burden and cost analysis. Lancet Diabetes Endocrinol. 2016 Dec;4(12):996-1003. doi: 10.1016/S2213-8587(16)30275-3.
[46] Head A, Fleming K, Kypridemos C, et al. (2021). Multimorbidity: the case for prevention J Epidemiol Community Health 2021;75:242–244. DOI:10.1136/jech-2020-214301
[47] Skou ST, Mair FS, Fortin M. et al. (2022). Multimorbidity. Nat Rev Dis Primers 8, 48. DOI: 10.1038/s41572-022-00376-4
[48] Russell et al (2019). Multimorbidity in Early Childhood and Socioeconomic Disadvantage: Findings From a Large New Zealand Child Cohort. Academic Pediatrics, 20(7),P619-627.
[49] Blakely T, Kvizhinadze G, Atkinson J, Dieleman J, Clarke P. (2019). Health system costs for individual and comorbid noncommunicable diseases: An analysis of publicly funded health events from New Zealand. PLoS Med. 16(1):e1002716. DOI: 10.1371/journal.pmed.1002716

preventative interventions would be more appropriate, and there is no health research institution employed in this task.

COVID caused a temporary rebound in communicable mortality, but it did not overturn the longer-run pattern. The longer trend remains one of declining infectious mortality and rising dominance of chronic disease, especially disease shaped by aging, metabolic risk, environmental exposure, and long-term psychosocial stressors.

[10] DISTORTED SCIENTIFIC CAPABILITY

Over the past decade, MBIE's science policy framework has increasingly shaped the direction of New Zealand's research system toward its stated priorities, particularly innovation-driven and technology-oriented outcomes. This has produced a form of path dependency, whereby funding signals reinforce particular research trajectories and institutional capabilities over time. As a result, the system has developed comparatively strong capacity in areas such as genetic disease research and gene technologies, while maintaining far less long-term capability in the mechanistic drivers of disease causation in real populations. Areas such as nutrient insufficiency, heavy metal exposure, pesticides, plastics, pharmaceuticals, and household and occupational exposures, and their cumulative biological effects remain relatively underdeveloped in terms of sustained national expertise. The shortfalls identified by organisations such as MNZH broadly reflect this pattern. New Zealand has limited depth of long-term research capability in areas such as the cellular drivers of metabolic disease, optimum nutrition and health, multimorbidity and polypharmacy, adverse drug reactions, and developmental neurotoxicity. Similarly, while scientists may be funded to develop new gene-editing technologies or organisms, there is far less publicly supported capacity to investigate the systemic ecological and health risks that may arise if such technologies are deployed at scale.

Cascading Governance Effects

These capability gaps do not remain confined to the research sector; they cascade across the machinery of government. When a science system develops path dependency in certain domains, scientists are less likely to step into advisory or expert roles in areas where long-term expertise has not been cultivated. This can create institutional hesitancy within the scientific community to challenge policy decisions when the underlying knowledge base is thin. Over time, the absence of recognised expertise can produce a self-reinforcing cycle: because few scientists are funded to work in particular areas, fewer experts exist to interrogate policy assumptions, and those assumptions may remain largely untested.

The effects become particularly visible in regulatory and policy processes. Agencies responsible for Regulatory Impact Assessments (RIA) and Regulatory Impact Statements (RIS) are often required to undertake cost–benefit analysis to support policy decisions. Yet these analyses depend heavily on the availability of robust scientific evidence and domestic expertise. Where the science system has not generated the necessary data or specialist knowledge—for example on cumulative environmental exposures, soil degradation, nutritional status, or chronic disease drivers—policy analysts may have limited capacity to question the underlying scientific assumptions. As a result, policies that are scientifically incomplete or insufficiently scrutinised may proceed largely unchallenged, not because the evidence is strong, but because the expertise needed to interrogate it is scarce.

Consequences for Public Systems

The downstream consequences are visible across multiple sectors. Regulators such as the Environmental Protection Authority must rely on a limited surrounding ecosystem of domestic expertise when evaluating environmental or chemical risks. Agricultural systems lack strong national capacity in integrative pest management, soil ecology, and catchment-scale environmental dynamics, making it more difficult for farmers and growers to reduce agrichemical reliance or respond to emerging soil degradation pressures. Forestry and land-use planning may proceed without sufficient systemic analysis of storm events and catchment interactions. In the health sector, clinicians may receive limited scientific guidance on issues such as metabolic disease drivers, refined carbohydrate burden, nutrient repletion beyond deficiency prevention, multimorbidity, and polypharmacy risks.

Researchers and scientists in universities and polytechnics were also bound by these funding specifications. This did not only shape research priorities; it shaped what could ultimately be known, investigated, and taught. Over time, funding signals influenced the scope of scientific inquiry and the knowledge base underpinning tertiary curricula, narrowing the range of expertise that could be developed across the system.

In this way, science policy does not simply influence the research portfolio; it shapes the practical intelligence available to the nation's institutions. When long-term public-good research capability is underdeveloped, the entire policy system, from regulatory decision-making to health services, agricultural practice and infrastructure planning, operates with a thinner evidence base than the complexity of modern challenges demands.

APPENDIX

(i) SAMPLE TEXT FOR A FUTURE ACT (PURPOSE, PRINCIPLES, FUNCTIONS, CAPACITY).

1 Purpose of this Act

The purpose of this Act is to establish a coherent national framework for the stewardship of research, science and technology in Aotearoa New Zealand.

This Act seeks to ensure that the national research and science system:

a. contributes to the long-term wellbeing of the people of New Zealand and the protection of the natural environment;
b. maintains and develops sovereign national capability in areas of scientific knowledge essential to human health, environmental protection, agriculture, and the sustainable management of national resources;
c. strengthens the role of publicly funded science in informing public policy, regulation, education and democratic decision-making;
d. supports the generation of public-good knowledge through discovery research, long-term monitoring and the development of national scientific capability; and

e. enables the State and the public to understand and responsibly steward the environmental, biological, economic and infrastructure systems upon which present and future wellbeing depends.

2 Principles guiding administration of the Act

The Principles of this Act are—

All persons exercising powers or performing functions under this Act must have regard to the following principles:

Stewardship and Kaitiakitanga

Scientific knowledge should support responsible guardianship (kaitiakitanga) of the natural environment, human health systems, national infrastructure and knowledge resources for the benefit of present and future generations.

Public-Good Science

Public investment in research should maintain scientific capability in areas where knowledge is necessary for societal wellbeing but may not be adequately supported by market-driven or innovation-led research.

Protection of Human and Environmental Health

The science system should support investigation of environmental, biological and social determinants of health, including chronic disease causation and cumulative environmental exposures.

Scientific Capability and Sovereignty

New Zealand should maintain sovereign scientific capability in areas essential to environmental stewardship, agriculture, public health, infrastructure resilience and resource management.

Transparency and Public Accountability

Publicly funded science should remain accountable to Parliament and the public, and the knowledge generated should support informed public decision-making.

Integration Across Systems

Research should recognise the interdependence of human health, environmental systems, agriculture, food systems, land systems and infrastructure.

Long-Term Knowledge Development

The science system should support sustained discovery research and long-horizon investigation where the benefits to society may emerge over extended timeframes.

3 Functions of the Ministry of Research, Science and Technology

The Ministry of Research, Science and Technology must—

a. steward the national research, science and technology system in the public interest;

b. maintain national scientific capability in areas critical to human health, environmental protection, agriculture and infrastructure resilience;
c. identify national knowledge gaps and support research necessary to address them;
d. support long-term monitoring of environmental systems, human health determinants and national infrastructure systems;
e. maintain national scientific datasets and knowledge infrastructure necessary for discovery science;
f. provide independent scientific advice to Ministers and Parliament;
g. ensure that publicly funded science supports education, professional training and the development of national expertise; and
h. support the generation of scientific knowledge necessary to inform the design, maintenance and long-term stewardship of national infrastructure systems, including water services, energy systems, transport networks, land systems and other long-lived public assets.

4 Duty to maintain national scientific capability

(1) The Minister and the Ministry of Research, Science and Technology must take reasonable steps to ensure that New Zealand maintains enduring scientific capability in areas of knowledge essential to the long-term wellbeing of the people of New Zealand and the protection of the natural environment.

(2) For the purposes of subsection (1), national scientific capability includes the maintenance of scientific expertise, research infrastructure, long-term datasets, and sustained research programmes necessary to investigate matters of national importance.

(3) Without limiting subsection (1), the Minister and the Ministry must ensure that scientific capability is maintained in areas including—

a. human health and chronic disease causation;
b. nutrition science and population nutritional status;
c. environmental health and environmental determinants of disease;
d. toxicology, chemical exposures, and cumulative environmental risk;
e. environmental monitoring of land, water, air and ecosystems;
f. agricultural system resilience, soil health and food systems;
g. the scientific foundations necessary for the stewardship of national infrastructure systems, including water services, energy systems, land systems, and other long-lived public assets.

(4) In performing this duty, the Minister and the Ministry must have regard to—

a. the need to sustain long-term scientific capability in areas where research benefits may emerge only over extended time periods; and
b. the importance of maintaining scientific capability in areas that may not be adequately supported by market-driven or innovation-led research investment.

(ii) SAMPLE TEXT FOR A FUTURE ACT: INSTITUTE FOR HUMAN AND ENVIRONMENTAL HEALTH RESEARCH AND SCIENCE

Institute for Human and Environmental Health Research

15 Establishment of the Institute

(1) The Institute for Human and Environmental Health Research is established as a Crown research institution responsible for maintaining national scientific capability in the investigation of the biological, environmental and social determinants of human health.

(2) The Institute's primary role is to undertake and support long-term scientific research necessary to understand and protect the health of present and future generations of people in Aotearoa New Zealand.

16 Functions of the Institute

The Institute must maintain national scientific capability and conduct research relating to—

a. human health, chronic disease causation, brain health and multimorbidity;
b. nutrition science, including research necessary to support optimal nutritional status across the population;
c. environmental health and environmental determinants of disease;
d. toxicology, chemical exposures, and cumulative environmental risk arising from environmental contaminants, industrial emissions, pesticides, plastics, medicines and other technologies;
e. adverse effects of medicines, including the investigation and monitoring of adverse drug events and the health impacts of polypharmacy; and
f. the biological and environmental factors affecting pregnancy, fetal development, childhood development and lifelong health.

17 National Monitoring of Human and Environmental Health Determinants

(1) The Institute must maintain national scientific capability for the long-term monitoring of environmental and biological determinants of human health.

(2) Monitoring under this section must include the development and maintenance of national datasets relating to—

a. environmental exposures affecting human health, including contaminants in air, water, soil and food systems;
b. nutritional status and nutrient exposures within the population;
c. chronic disease trends and multimorbidity patterns;
d. adverse drug events and the health impacts of polypharmacy; and
e. indicators relevant to pregnancy, fetal development and childhood health.

(3) The datasets described in subsection (2) form part of New Zealand's national scientific knowledge infrastructure and must be maintained to support scientific research, public health policy and regulatory decision-making.

18 Duty to Fund Human and Environmental Health Research

(1) The Minister must ensure that adequate and sustained public funding is provided to maintain the scientific capability and monitoring systems established under this Part.

(2) Funding under subsection (1) must support—

a. long-term interdisciplinary research programmes;
b. national monitoring datasets; and
c. the scientific infrastructure necessary to investigate environmental and biological determinants of disease.

(3) The Minister must ensure that the real value of funding provided under this Part is maintained over time, including adjustments to reflect inflation and the costs associated with maintaining national scientific capability.

19 Reporting on Human and Environmental Health

(1) The Institute must prepare a National Human and Environmental Health Report at intervals of not more than five years.

(2) The report must summarise monitoring data and identify emerging risks relating to—

a. chronic disease causation and multimorbidity;
b. environmental exposures affecting human health;
c. nutritional status of the population;
d. adverse drug events and polypharmacy; and
e. risks affecting pregnancy, foetal development and childhood health.

(3) The Minister must present the report to the House of Representatives as soon as practicable after receiving it.

(iii) SAMPLE TEXT FOR A FUTURE ACT: AGRICULTURAL RESEARCH AND SCIENCE

25 Public-good mandate of AgResearch

(1) AgResearch is affirmed as a national public research institution responsible for maintaining scientific capability necessary for the long-term stewardship, resilience and productivity of New Zealand's agricultural systems.

(2) In performing its role, AgResearch must prioritise the development of scientific knowledge that supports—

a. the long-term health and biological function of soils;
b. sustainable pasture, crop, forestry and horticultural systems;
c. plant and animal health through improved understanding of nutrient pathways, trace element balance and ecological resilience;
d. the prevention and management of pests, weeds and diseases affecting agricultural systems;

e. the protection of water quality, ecosystems and environmental health associated with agricultural land use; and
f. the long-term productivity, resilience and export integrity of New Zealand's primary sector.

26 Long-term agricultural systems research

(1) The Minister must ensure the maintenance of sustained national research capability in agricultural systems science.

(2) Without limiting subsection (1), this capability must include research programmes addressing—

a. soil biological health, nutrient cycling and soil resilience;
b. plant nutrition, crop health and nutrient density of agricultural products;
c. animal nutrition, metabolic health and disease prevention in livestock systems;
d. integrated pest management, resistance management and pest ecology;
e. impacts of agrichemicals, fertilisers and other inputs on soil systems, ecosystems and human health;
f. climate variability and environmental pressures affecting agricultural systems; and
g. the long-term resilience of farming, horticultural and forestry systems across New Zealand's regions.

(3) Research under this section must recognise the interconnected nature of soil, water, plant, animal, climate and human systems.

27 Protected funding for public-good agricultural science

(1) The Minister must ensure that a defined portion of public research funding is allocated to long-term agricultural systems research that serves the public good.

(2) Funding under this section must support research programmes that—

a. may not generate intellectual property or commercial products;
b. require long-term monitoring or multidisciplinary investigation; or
c. are necessary to maintain scientific capability in areas essential to agricultural resilience and environmental stewardship.

(3) Funding under this section must be allocated for research programmes of sufficient duration to enable the investigation of long-term biological and environmental processes.

28 Agricultural knowledge exchange and extension

(1) The Ministry must support mechanisms that enable effective exchange of knowledge between scientists, farmers, growers and land managers.

(2) These mechanisms may include—

a. extension services;
b. regional demonstration programmes and field trials;
c. collaborative research programmes with farmers and growers; and

d. systems for incorporating farmer and grower observations into research design and monitoring.

(3) The purpose of this section is to ensure that scientific knowledge informs agricultural practice and that observations from agricultural systems inform scientific research.

29 National monitoring of agricultural system health

(1) AgResearch must maintain national scientific capability for the long-term monitoring and assessment of the biological condition of New Zealand's agricultural systems.

(2) For the purposes of subsection (1), AgResearch must develop, maintain, and periodically report on national datasets relating to—

a. soil biological health, soil chemistry, and soil physical condition;
b. nutrient status and trace element balance in agricultural soils, pasture systems, and cropping systems;
c. pest, weed, and plant disease pressures affecting agricultural production systems;
d. indicators of ecological condition within agricultural landscapes, including impacts on water systems and biodiversity; and
e. any additional indicators necessary to understand the resilience, productivity, and sustainability of agricultural systems.

(3) The datasets described in subsection (2) form part of the national scientific knowledge infrastructure and must be maintained to support scientific research, agricultural decision-making, and public policy development.

Funding Obligation

30 Duty to provide funding for agricultural monitoring

(1) The Minister must ensure that adequate and sustained public funding is provided to maintain the national monitoring systems established under section 19.

(2) Funding provided under subsection (1) must be sufficient to support—

a. the maintenance of long-term datasets;
b. the scientific capability necessary to collect, analyse, and interpret monitoring data; and
c. the publication and dissemination of monitoring results.

(3) In determining funding levels under this section, the Minister must ensure that the real value of funding is maintained over time, including adjustments to reflect changes in inflation and the costs associated with maintaining scientific monitoring infrastructure.

(4) The purpose of this section is to ensure the continuity of national monitoring programmes necessary for the stewardship of agricultural systems and the protection of long-term national productivity and environmental health.

31 Reporting on Agricultural System Health

(1) AgResearch must prepare a report on the condition and trends of New Zealand's agricultural systems at least once every five years.

(2) The report must summarise national monitoring data and identify emerging risks to soil health, agricultural productivity, ecosystem integrity and environmental health.

(3) The Minister must present the report to the House of Representatives as soon as practicable after receiving it.