

Public Health Service Configurations

A brief literature review (2019 update)



Canterbury

District Health Board

Te Poari Hauora o Waitaha

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Background

This 2019 review update was undertaken to provide the most up-to-date evidence to inform the Health and Disability System Review panel as it considers “the role of public health and prevention in supporting health and wellness” (Health and Disability System Review, 2018, p.2).

Introduction

Developed countries, with different histories, cultures and political experiences, have evolved different institutional arrangements for funding and delivering health services — despite broadly common objectives (e.g., universal access, effective care, improved health outcomes, efficient use of resources, high-quality services, and responsiveness) (Saltman, Bankauskaite, & Vrangbæk, 2007). Public health systems in many developed countries face common challenges including limited local capacities, financial pressures, and increasing demand. Historical areas of focus such as infectious disease control and environmental protection are now supplemented by the growing challenges of chronic disease, wellbeing, planetary health, and equity (Baker & Koplan, 2002; Baker et al., 2005; Mays et al., 2009). Studies in developed countries have found wide variation in the size, governance, and control of public health organisations, and in the delivery of the essential services needed to meet these challenges (Mays, Halverson, Baker, Stevens, & Vann, 2004; Mays et al., 2009). Different system configurations may influence governance characteristics, economies of scale and scope, inter-organisational partnerships, resourcing and staffing, innovation, and the many other factors that determine the availability, quality, and equitable distribution of public health services across communities (Hoornbeek, Morris, Libbey, & Pezzino, 2019).

To achieve equitable health outcomes, countries will require stronger platforms for effective intersectoral actions (Fryatt, Bennett, & Soucat, 2017). These intersectoral actions will require strong governance (the systematic, patterned manner by which decisions are made and implemented) (Green, Wismar, & Figueras, 2016) and new partnerships and opportunities for dialogue. Improving the understanding of the effects of governance on policies may improve overall outcomes (Fryatt et al., 2017).

In seeking improvements in public health service configuration, the full costs of transformations need to be considered alongside the expected benefits. The restructuring of a public health system is likely to incur large transformation costs: these include direct financial costs, as well as indirect costs due to the necessary contribution of staff time and effort towards new arrangements, structures, systems and relationships, rather than the delivery of public health services (Madelin, 2011). Furthermore, during a transition period there are likely to be impacts on staff morale and wellbeing and a loss of experienced staff, and consequently a reduction in institutional knowledge (Madelin, 2011).

Furthermore, as the social determinants of health are the primary factors influencing population health and health equity (Marmot, Friel, Bell, Houweling, & Taylor, 2008), it has been argued that both *capacities* and *configurations* must be addressed to effectively achieve a positive shift in population health outcomes (Guglielmin, Muntaner, O'Campo, & Shankardass, 2018).

Scope

This review focuses on the configuration of public health services in jurisdictions outside New Zealand (see Box 1 for an overview of New Zealand's Public Health system). For the purpose of this review, public health services are considered to be any services that contribute to the delivery of New Zealand's core public health functions (New Zealand Public Health Clinical Network, 2011; Williams, Garbutt, & Peters, 2015)¹. The five core functions are health assessment and surveillance ('understanding health status, health determinants and disease distribution'); public health capacity and development ('enhancing our system's capacity to improve population health'); health promotion ('enabling people to increase control over and improve their health'); health protection ('protecting communities against public health hazards') and preventive interventions ('population programmes delivered to individuals', usually in the primary care setting)². The outcomes sought by public health service delivery in New Zealand are: a healthier and more productive population, reduction of health disparities, improvement in Māori health, increased safeguards for the public's health, and a reduced burden of acute and chronic disease (Minister of Health, 2016; Williams et al., 2015) (Figure 1).

¹ Note: In New Zealand, occupational health and food safety are not within the scope of Public Health.

² Such as, aspects of immunisation, screening, communicable disease control, health promotion, smoking cessation, intersectoral actions, and other points of interface between Primary Care and Public Health (Ministry of Health, 2003). For these services, equitable and consistent provision is based on a public health approach.

Figure 1: Public Health Principles, Core Functions, Services, and Outcomes



Figure 1 illustrates the links between functions, services and outcomes. Public health services are not static, but evolve in response to changing needs, priorities, evidence and organisational structures.

Source: Adapted from *New Zealand Health Strategy: Future direction, 2016* (Minister of Health, 2016) and *Core public health functions for New Zealand* (Williams et al., 2015).

Box 1

New Zealand's public health system: history and overview*

Note: although the term “public health” is well recognised internationally and New Zealand has a strong public health tradition, the term itself can be confusing in this country, as our publicly-funded health care system is widely referred to as “the public health system”.

For most of last century, public health services in New Zealand were provided by the Department of Health's District and Head Offices. However, since 1989 central public health responsibilities have been held variously by the Ministry of Health (and its Director of Public Health, Public Health Group, and Public Health Advisory Committee), the Public Health Commission, the National Health Board, and other Crown Entities.

In 2018 a new Population Health and Prevention Directorate brought Ministry public health staff together again, including the office of the Director of Public Health (a statutory officer who may advise or report directly to the Minister of Health). Areas of focus and expertise reflect recent Ministry history, including substantial attrition of public health staff.

Some national technical public health services are provided under contract by the Institute of Environmental and Scientific Research. The Health Promotion agency, a Crown Agency established in 2012, focuses largely on health education with an emphasis on social marketing, although it also inherited alcohol research and policy advice responsibilities from the former Alcohol Advisory Council. Responsibility for occupational health and food safety now rest with the Ministry of Business, Innovation & Employment and the Ministry for Primary Industry, respectively.

New Zealand's twenty district health boards (DHBs) have a statutory responsibility to improve, promote and protect the health of people and communities. Each must appoint a Community and Public Health Advisory Committee, but there are no other requirements for public health roles or expertise. DHB funding and accountabilities are focused on health care services, and the Ministry of Health contracts separately for national and local public health services, based on national public health service specifications.

The public health responsibilities of the previous Department of Health District Offices were passed on first to Area Health Boards, then Hospital and Health Services, and now rest with twelve DHB public health units (PHUs), each fulfilling local statutory public health functions on behalf of the Ministry of Health, and providing a range of other public health services across one or more DHBs. PHUs vary widely in size and in the services they deliver. The Ministry also maintains several hundred contracts for public health services with national, regional and local non-government organisations.

Some preventive care services, such as immunisation, screening, and smoking cessation services, are delivered by health care providers with public health funding, often with co-ordination or support from national or local public health staff.

* There is no current official description of public health systems in New Zealand. This outline is based on accounts by Skegg (2019), the Public Health Clinical Network *Future Shape* report (Public Health Clinical Network, 2015), and verbal communications with current public health unit staff.

Methodology

Current literature on public health service configurations was identified by conducting electronic journal searches through the Google and Google Scholar search engines, and Scopus, Ovid (all resources) and Web of Knowledge. The search terms "public health"; "disease surveillance"; "health promotion"; "health protection"; "environmental health"; "decentralized OR centralized OR devolved"; "structure OR function OR sector" were applied to locate relevant articles. Searches were limited to the date range 2015–2019 (March). Further articles were found through examining the citations and reference lists of key articles, by conducting searches of principal researcher's recent publications, and through examining the websites of international public health organisations. Articles published in peer reviewed journals and reports published by government departments or NGOs were considered for inclusion. Abstracts of articles identified in the literature search were screened and ranked by one reviewer. Articles which did not meet the scope were excluded.

Limitations

There is limited literature discussing the advantages and disadvantages of different public health service configurations. There are few published evaluations of public health service configurations or comparisons between different configurations. A large proportion of the literature is limited to describing the public health service configuration of a particular jurisdiction, or the *a priori* reasons why a particular configuration was adopted. Further, most comparative effectiveness studies are focused at the level of the whole health system, and while *public health* configurations and services may be discussed, any health outcomes are generally considered at the overall (system) level.

The discussion in the literature reviewed universally focuses on countries with populations much larger than New Zealand's, often with an additional layer of government (e.g., state and federal government). There is also great variation in the political, legal, social, and developmental contexts of the various public health service configurations discussed. However, many of the reports do include some information on public health service configuration within a state, province, or region with *similar* population size to New Zealand, and this provides some basis for comparison (albeit still placed within two-tier government structures). Some literature also relates to countries with fundamentally different overall health system configurations, as is the case for the USA, which does not have universal (or near-universal) coverage for core medical services (Barua, Hasan, & Timmermans, 2017). Other differences include countries' age profiles, chronic illnesses profiles, and geographical characteristics. Despite these differences, there are a number of common themes that repeat across studies. This commonality suggests that these themes may be relevant to New Zealand, although they must be interpreted in the light of the New Zealand context.

There is little information in the international literature about how public health configuration affects equity of public health service delivery, and what discussion there is focuses on equity between regions within a country rather than, for example, ethnic or gender equity. As such, there is little specific information in the literature to inform the design of public health configurations to improve equity of outcomes for Māori.

The study of public health practice is evolving, aided by the development of core-function frameworks and agreed-upon sets of essential public health services and measures, although the measurement of system performance remains complicated by a host of organisational, contextual, economic, political, and sociocultural factors (Hyde & Shortell, 2012).

Findings

Themes

This review identified six themes or topic areas in the discussion of public health service configurations in different jurisdictions:

- 1) The spectrum between centralised and decentralised systems of control and accountability.
- 2) The association between local public health authorities and local government.
- 3) The size of the population covered by a single local public health authority and the efficient delivery of services.
- 4) The association between national public health authorities and national government.
- 5) The importance of strong leadership and a clear vision for public health.
- 6) The range of models used to ensure that core public health functions are implemented.

Each of these themes is discussed in more detail in the following sections.

Centralised and decentralised funding, delivery, and accountability

Decentralisation in this context is taken to describe a spectrum of options for transferring the funding, planning, delivery, and lines of accountability for public health functions from central government, or a central agency, to regional or local levels. The rationale behind decentralisation is that smaller organisations are inherently more agile, accountable, and innovative than are larger organisations (Saltman et al., 2007). The distinction between decentralised and centralised health systems is a matter of degree. The commonly stated aim of decentralisation is to allow local public health authorities to tailor public health measures to the local population. It can be argued that greater local autonomy enables more equitable outcomes, compared with what can be achieved when a national authority mandates the implementation of uniform public health programmes across an entire country (i.e., decentralisation is said to increase government responsiveness to local needs) (Bossert, 1998; Faguet, 2004; Mays et al., 2009; Royal Society for Public Health, 2013). Decentralisation may also result in better penetration of national public policies via greater administrative capability at the local level (Saltman, Busse, & Figueras, 2006; Saltman et al., 2007). Supporting this effect, authors cite numerous examples of decentralised public health service configurations offering a broader range of services than centralised configurations (Atkinson, Cohn, Ducci, Fernández, & Smyth, 2008; Atkinson, Cohn, Ducci, & Gideon, 2005; Craig, 2011; Mays & Smith, 2009; Mays et al., 2009) although the literature identified for this review contained no investigations of whether a broader range of services actually improves health outcomes or equity. Some authors also suggest that local autonomy gives public health authorities greater opportunity to develop a close relationship with local government and to better influence social determinants of health (Jenkins et al., 2016b; Madelin, 2011; Royal Society for Public Health, 2013; South, Hunter, & Gamsu, 2014).

Decentralisation also has the potential for negative effects. One argument against decentralisation is that local agencies may lack the human, financial and technical resources necessary for the delivery of appropriate public services, and therefore, power should remain in the hands of central governments that are relatively resource rich (Shah, 1999). Decentralisation may also negatively influence equity by introducing inter-regional disparities, by incentivising unhelpful competition and/or deregulation (e.g., local governments competing against each other to attract profitable

business and more investments), and decentralisation may also result in the multiplication of administrative tiers and the duplication of tasks, and the possible failure to meet national objectives (Jacobsen & Thorsvik, 2002; Saltman et al., 2007). Centralisation can potentially provide clearer leadership, ensure standardisation, and improve predictability in organisational practice (Mintzberg 1979; Jacobsen and Thorsvik 2002).

The literature suggests that effective decentralised public health service configurations share at least two common attributes:

- A centralised planning and implementation structure where local agencies remain accountable to some central agency at a strategic level and for specific key functions (i.e., where the central government agency concentrates on 'adding value' in activities that are more efficiently performed at the national level or benefit from standardised approaches, such as developing national guidelines, targets, and common surveillance), *but* local agencies retain control of operational and locally-strategic decisions, often with additional accountability to the local population (e.g., through an elected local board or association with local government) (Atkinson et al., 2008; Craig, 2011).
- Non-competitive funding structures that ensure all local jurisdictions receive adequate funding to implement national and local public health strategies (i.e., a formulaic funding system administered by the central agency) (Atkinson et al., 2008; Mays & Smith, 2009).

Accountability of local agencies to a central agency helps ensure that local public health agencies implement national strategic priorities. Examples of such arrangements include central health promotion strategies implemented by local public health authorities in Chile (Atkinson et al., 2008) and the Canadian province of Nova Scotia (Moloughney, 2006). In contrast, jurisdictions where local agencies are not accountable to a central agency may experience variable strategic direction and inequitable service provision (Atkinson et al., 2008; Atkinson et al., 2005; Marchildon, 2013; Wyss & Lorenz, 2000). Examples include Brazil (Atkinson et al., 2008; Atkinson et al., 2005), Switzerland (Wyss & Lorenz, 2000), and Canada prior to 2003 (Marchildon, 2013). In all of these cases, some local public health authorities had failed to adopt modern public health strategies such as health promotion, despite encouragement from central authorities and successful implementation by neighbouring local public health authorities.

Local public health authorities also require a reliable funding stream to be able to deliver on central strategic priorities. Competitive funding models tend to disproportionately favour large, wealthy local public health authorities, which have greatest capacity to apply for funds (Atkinson et al., 2008). In Chile, a competitive system means that many small rural public health authorities are unable to obtain any central funding, so have no capacity to undertake health promotion activities (Atkinson et al., 2008). In contrast, systems which allocate funds based on service delivery ensure that all local public health authorities have funding for key activities (Atkinson et al., 2008; Madelin, 2011). Such a system in Brazil results in widespread delivery of key services despite a lack of central strategic direction (Atkinson et al., 2008).

Although accountability to a central agency appears to facilitate consistent local public health service delivery, too much central control can leave local public health authorities with insufficient

autonomy to adapt their programmes to reflect local needs, negating the benefits of decentralisation (Atkinson et al., 2005). Similarly, excessive central control can cause some core functions to be seen as separate activities, unrelated to local public health strategy. For example, some local public health authorities in Chile implement national health promotion strategies, but do not see health promotion as part of their core business (Atkinson et al., 2008).

An alternative model to centralised control is the United States' Centers for Disease Control's (CDC) voluntary accreditation and quality improvement programme (Baker, Beitsch, Landrum, & Head, 2007; Riley et al., 2012). This programme provides limited financial incentives to state public health authorities that gain and maintain accreditation, with the aim of improving consistency across different states (Riley et al., 2012)³. The accreditation programme employs a specially developed and tested set of standards and measures organised around the CDC's 10 Essential Public Health Services (Bender et al., 2007; Morris, Hoornbeek, & Stefanak, 2015). As of May 2016, approximately half the U.S. population is covered by an accredited health department⁴. In a survey of health departments, conducted during 2013–2016, greater than 90% of those that had been accredited for 1 year reported that accreditation had stimulated quality improvement and performance improvement opportunities, increased accountability and transparency, and improved management processes (Kronstadt et al., 2016). Other benefits reported by accredited health departments (via focus groups) included: increased use of quality improvement information in decision-making; improved identification and use of evidence-based programs and metrics; improved visibility, credibility, and reputation among their community partners; and increased collaboration (Kronstadt et al., 2016). Local health departments accredited by June 2017 reported more formal quality improvement activities (QIs) and showed greater improvements with performance management (PM) over time, compared with non-accredited health departments (Beitsch, Kronstadt, Robin, & Leep, 2018). The evaluation found that accredited organisations generally offered a broader and more comprehensive array of public health services, and involved more system partnerships in the delivery of those services (Ingram, Mays, & Kussainov, 2018). These initial evaluation findings suggest that health departments that have participated in the accreditation process have experienced tangible benefits.

In addition to the main dimension of *centrality* (central/federal government vs. local control) public health delivery systems can be further described in terms of their local-level *differentiation*, *integration*, and *concentration* (Mays, Scutchfield, Bhandari, & Smith, 2010). Differentiation describes the range or number of programmes and services that are delivered through the public health system, including partner agencies (i.e., the scope of services provided; narrow or wide). Integration is defined as the degree to which public health services are provided through organisational partners (i.e., the horizontal distribution of effort; the number of ties among organisations and the strength of these ties). Finally, *concentration* describes the distribution of authority and effort away from the main local-level government agency, among all the organisations contributing to local-level public health services (i.e., the degree to which the workload is spread horizontally from the public health unit). How well a public health system is integrated, and the

³ The accreditation process involves: self-assessment; preparation of documentation including a community health assessment, a community health improvement plan, and an organisational strategic plan; formal application; peer site visits; and committee review.

⁴ The health departments included in this study were diverse in size, geographic location, and structure, although they might not be representative of all health departments.

degree to which services are concentrated or distributed from the local public health unit depends on the partner organisations' ability and willingness to contribute to public health activities (Zahner, 2005). The optimal structure for a particular community is likely to hinge on the local circumstances that shape the ability and willingness of other organisations to engage in public health activities. Studies of integration in public health suggest that partnerships and coalitions have the advantage of expanding the reach of governmental public health agencies (Roussos and Fawcett 2000; Zahner 2005) and that, at least under some conditions, implementation of collaborative partnerships is associated with improvements in population-level outcomes (Roussos & Fawcett, 2000).

The literature reviewed does not describe *one* optimal organisational configuration for public health delivery at the local level, or identify the particular circumstances in which a given configuration would perform best. However, the dimensions of *differentiation, integration, and concentration* provide a starting point for considering different local-level configurations and their potential to improve population-level outcomes, community-wide behaviour change, and/or systems change (Roussos & Fawcett, 2000). These local-level characteristics can also be applied to discussions of public health integration with local government (page 10).

Taken together, the literature pertaining to decentralised systems of control and accountability suggests that a moderate degree of decentralisation can enable the 'best-fit' of different public health functions/services within an overall health system structure (i.e., some at national level, some at local level; although most have local and central components). Services that tend to be grouped together within centrally controlled government structures include those that require substantive funding, require universal coverage, and demand highly standardised methodologies and implementation, such as national data collection and analysis, disease surveillance, immunisation, cancer screening programmes, reference laboratory networks, food regulations and other regulatory frameworks, as well as other high-level health protection and health promotion activities.⁵

Conversely, many other services appear to suit decentralised implementation where local public health authorities can partner with other government and non-government agencies to tailor public health measures to local population groups. In this way, decentralisation can support the differentiation of services (the number or breadth of services provided) and the integration of service delivery (the joining-up of agencies to enhance capacity and service delivery) (Mays et al., 2010). Some studies suggest that moderately-to-highly differentiated public health systems may be preferred to other models, at least for high income countries, as they tend to provide increases in technical efficiency and improved tailoring within local communities (Arends, 2017; Channa & Faguet, 2017; Marchildon, 2005).

⁵ Some of these services (e.g., disease surveillance) can also involve reporting back to the WHO and other relevant international bodies.

Local public health authorities and local government

A number of different jurisdictions have pursued greater health and social care integration by placing public health responsibilities within local government, in part because partnerships are increasingly seen to be a prerequisite for tackling 'intractable problems' (those issues so complex that their solutions appear to require a multi-agency, determinants of health approach) (Atkinson et al., 2008; Mays et al., 2009; Miller & Glasby, 2016). Research from both North and South America suggests that public health authorities housed within local government can achieve closer working relationships with other parts of local government and are more accountable to the local population (Atkinson et al., 2008; Mays et al., 2009). This close relationship may allow for greater influence over social determinants of health, and better adaptation of national strategies to match local needs (Cummings, 2013; Madelin, 2011).

This premise led to most public health functions being shifted to local regional authorities in England's 2013 public health transformation⁶ (Box 2, Cummings, 2013; Exworthy et al., 2016; Madelin, 2011; Miller & Glasby, 2016). A critical analysis of the impact of the structural reform of the public health system, and its likely ability to improve population health, has been undertaken over five time-points (Gadsby, Peckham, & Coleman, 2016; Gadsby et al., 2014; Jenkins et al., 2015, 2016a; Peckham et al., 2015). The iterative evaluation involved two rounds of surveys of Directors of Public Health and lead councillors for health in local authorities, and case studies in five areas of England (Gadsby et al., 2014). Firstly, the authors reported that support for a stronger local government role in public health was widespread, but *how* the public health function and responsibilities were being developed varied

Box 2

English public health transformation

England adopted a new public health service configuration in 2013 (Cummings, 2013; United Kingdom Department of Health, 2010). One of the key changes is the transfer of responsibility for much of public health to local government (a return to where these responsibilities sat pre-1974) (McKee et al., 2011). The Government's key aims for integrating public health into local government were to provide opportunities for working across authorities (e.g., with education, social care, planning, transportation), and to provide local democratic leadership to build public health innovation (Jenkins 2016). An independent government agency (Public Health England) retains central strategic oversight and responsibility for health protection, surveillance, knowledge translation, and national health promotion initiatives. Leadership of Public Health England is provided by a team of three clinical directors (a chief knowledge officer, a director of health protection, and a director of health promotion and population health) supported by a parallel team of corporate directors (Exworthy, Mannion, & Powell, 2016). Local health promotion becomes the responsibility of upper-tier local authorities (equivalent to New Zealand regional councils, but with considerably broader social care, health, and wellbeing responsibilities), with accountability to both Public Health England and their local elected council. Central funding to local authorities for local health promotion commissioning is ring-fenced and available to any service provider that meets NHS standards and costs (Cummings, 2013). The return of public health to upper-tier local authorities endorsed the Marmot agenda for change, acknowledging that local authorities are well placed to adopt the life-course perspective articulated by Marmot following the 2010 Marmot review (Marmot, 2010).

⁶ The British NHS is of significance among health policy analysts because it represents arguably the best attempt made by a high-income country to implement a national health system with universal access to care that is free at point of service.

considerably. Further, the Directors and councillors generally indicated greater influence on priorities for health and health improvement since the reforms, and that this went across the local authority and beyond (Jenkins et al., 2016b). Some elected members reported that they were able to apply local 'granular' knowledge to prioritisation processes, by virtue of elected members having 'soft' intelligence of their local ward constituencies. The greater influence reported occurred most notably when the transfer of staff to local government had 'proceeded well' and when collaborative working relationships and local partnership groups had formed (Jenkins et al., 2016b). Overall, the evaluation authors reported that some of the opportunities identified prior to transformation had been realised, including examples of collaborative working, and innovative use of resources.

The authors also noted a number of limitations and challenges: that two-tier councils faced particular challenges in co-ordinating public health activities (Cummings, 2013; United Kingdom Department of Health, 2015); that many of the positive outcomes were highly dependent on a range of locally contextual factors; and that the new configuration and its implementation had paid insufficient attention to the 'nature and quality of relationships across the various organisations and individuals, and the overlaps, gaps, synergies and contradictions amongst their roles and responsibilities' (i.e., those elements that ultimately determine the effectiveness of the system) (Gadsby et al., 2016, p.111). In conclusion, the authors noted that considerable organisational upheaval had exerted a significant impact on the way the new public health configuration was developing, and that the system configuration remained in a continuing state of flux (Gadsby et al., 2016). Arguably, the long-term test of the new public health configuration in England will be the degree to which local government uses the levers available to it for improving health in the widest sense, including education, housing and transport (i.e., putting health improvement and the narrowing of health inequalities at the core of its work) (Smith, Hill, & Bamba, 2016).

In addition, a number of studies have identified some benefits, but mainly challenges, specifically relating to local-level funding. Local public health organisations housed within local government may have the ability to raise funds locally, and therefore be less reliant on central funding sources. However, where local funding is common practice, local public health authorities have less accountability to central public health agencies, and exhibit high levels of variability of public health service delivery (Atkinson et al., 2008; Mays & Smith, 2009; Wyss & Lorenz, 2000). More wealthy urban jurisdictions tend to be well served, while less wealthy rural jurisdictions tend to be poorly served (Atkinson et al., 2008; Mays & Smith, 2009), and service provision may therefore be weakest in regions of greatest need, exacerbating existing inequalities. Similarly, many commentators have expressed concern that local government control of public health strategy or funding can lead to politicisation of public health, especially if overall local government funding is under pressure (Cummings, 2013; Madelin, 2011; Royal Society for Public Health, 2013). These concerns are supported by the observations that locally gathered funds tend to be spent on electorally popular treatment and health protection activities, rather than prevention or promotion activities (Atkinson et al., 2008; Vitoria et al., 2011), and are associated with variable and inequitable service provision (Atkinson et al., 2008; Mays & Smith, 2009).

Overall, the potential merits of shifting selected public health services to local government may depend on a particular jurisdiction's current distribution of authority and effort among/across the existing providers (in particular, the existing scope of local government's health, wellbeing, and social care responsibilities). A number of systematic reviews (Hyde & Shortell, 2012; Roussos &

Fawcett, 2000; Zahner, 2005) have identified the need for public health units to engage in broader collaborations with other sectors, particularly in respect to addressing the wider determinants of health, by working across authorities, for example with education, social care, planning, and transportation. These collaborative relationships may range from the opportunistic sharing of information and capacity to more formalised changes to the overall structure and organisation of local and state public health and social care service delivery (Hyde & Shortell, 2012).

In the New Zealand context, a substantive shift of public health services to local government would be far-reaching and would involve substantial changes to District Health Boards' and Local Government's current responsibilities in health, social care, and wellbeing (currently typically narrow in New Zealand compared to many jurisdictions). Guidance from the literature in this area remains somewhat limited and, to date, less than compelling. Nevertheless, health systems need to develop and maintain a platform for the delivery of an effective and culturally equitable public health response to the many emerging threats to health. Formalised changes to the overall structure and organisation of service providers across or between state agencies may be beneficial in some circumstances (Hyde & Shortell, 2012).

Population size

Studies using ecological designs to examine local public health services in the United States suggest that local public health authorities covering larger populations perform better than those with smaller populations (Mays et al., 2004; Mays et al., 2006; Richards et al., 1995; Turnock, Handler, & Miller, 1998), even after accounting for population wealth and per capita public health spending⁷ (Mays et al., 2004; Mays et al., 2006). The most comprehensive study (Mays et al., 2006) assessed the performance of 315 local public health services in seven states, serving populations of between 4,000 and 7.3 million people. Performance was assessed using ten indicators based on the United States Centers for Disease Control National Public Health Performance Standards programme's ten essential public health services (United States Centers for Disease Control and Prevention, 2014) (Box 3). For all indicators, gains in performance were greatest up to populations of 100,000 people. Seven out of ten indicators suggested optimal performance with populations around 500,000 people, with reductions in performance for populations greater than 500,000 people (Mays et al., 2006). This finding suggests that small public health systems may face special challenges in performing services even when

Box 3

The CDC's 10 essential public health services

1. Monitor health status to identify community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. *Link people with needed personal health services and ensure the provision of health care otherwise unavailable.
8. Ensure a competent public health and personal health care workforce.
9. Evaluate the effectiveness, accessibility, and quality of personal and population-based health services.
10. Conduct research to produce new insights and innovative solutions to health problems.

*Note: different service scope to New Zealand

⁷ Empirical evidence demonstrates that increased local health department spending is associated with higher levels of public health system performance, therefore the analysis needs to adjust for this variable.

funding and staffing levels on a per-capita basis are comparable to larger systems. This is likely to be because small systems typically operate with fewer total staff and hence they may lack the diversified workforce needed to perform in highly specialised roles, such as health informatics, epidemiology, and biostatistics (Atkinson et al., 2008; Mays et al., 2009; Moloughney, 2006), while authorities with populations greater than 500,000 experienced challenges with communication, coordination, and tailoring services to meet the needs of subgroups within their populations (Mays et al., 2006). Some authors suggest that consolidation of small local public health authorities into larger regional authorities, serving approximately 500,000 people, could improve public health service delivery for local government areas with small populations (Mays et al., 2009; Moloughney, 2006), especially in rural areas (Atkinson et al., 2008). However, there is no discussion of how consolidation might affect the ability of local public health authorities to deliver specifically tailored services to local populations.

Mays et al. (2006) demonstrated that system size was a strong predictor of performance for most public health services, and that at some point the economies associated with delivering public health services to large populations may erode because of the difficulties of managing multiple programs and activities for numerous demographic and geographic subgroups within the population. Mays et al. (2006) also identified two specific areas, *policy development and planning* (essential service 5) and *research* (essential service 10), as areas where public health systems appear to experience difficulty in meeting national performance standards. Mays et al. (2006) conclude that administrators of large public health systems should weigh carefully the potential benefits of consolidation against the possible complexities of large-scale public health operations⁸.

National public health authorities

The configuration of national public health authorities ranges from being part of a government department under full political control, to a separate agency independent from government with a protected funding stream (these types of agencies typically have a narrow remit around major causes of preventable non-communicable diseases, for example focusing on tobacco or alcohol). It can be argued that separate agencies outside of government can potentially decrease politicisation of public health, increase the credibility of the central authority, foster a collaborative culture with local public health authorities, and increase retention of public health professionals through a more engaging organisational culture (Naylor, 2003). Some attempts to establish separate agencies in Australia,⁹ Canada,¹⁰ and in New Zealand^{11, 12} (discussed below) have demonstrated the difficulties that may be encountered in establishing agencies that can substantively achieve their goals. However, the more recent (2013) establishment of Public Health England has been judged more favourably by some commentators (Boswell, Cairney, & St Denny, 2019), although evaluations and case studies suggest that it is not without substantial and ongoing challenges (Gadsby et al., 2016; Gadsby et al., 2014; Jenkins et al., 2016a; Jenkins et al., 2016b; Miller & Glasby, 2016).

⁸ It is important to note the possible limitations of this research, in particular, the generalisability of the findings to the New Zealand context (e.g., considering system of government, GDP, population profile, population density, wealth distribution, cultural, geographic, and other factors).

⁹ Australian National Preventive Health Agency, "Australian National Preventive Health Agency Bill," 2009

¹⁰ Public Health Agency of Canada, (PHAC), Naylor, 2003

¹¹ Public Health Commission (PHC), New Zealand Health and Disability Services Act 1993

¹² Health Promotion Agency (HPA), New Zealand Public Health and Disability Act 2000

Australia

Prior to establishment of the ANPHA in Australia in 2009 (Australia's first national preventative health agency), the Consumers' Health Forum expressed concern that its independence would be compromised as it was still accountable to health ministers and had no protective legislation (Consumers Health Forum of Australia, 2009). This concern was realised in 2014 when, following a change in government, the ANPHA was disestablished ("Australian National Preventive Health Agency (Abolition) Bill," 2014; Meers, 2015), reflecting the new government's philosophy "that individuals need to take responsibility for lifestyle actions that affect their health" (Dutton, 2014).

Canada

The Public Health Agency (PHAC) is an agency of the Government of Canada, formed in 2004. PHAC is responsible for public health, emergency preparedness and response, and infectious and chronic disease control and prevention. PHAC was created in response to growing concerns about the capacity of Canada's public health system to anticipate and respond effectively to public health threats – specifically, following analyses of the public health system's shortcomings during the 2003 SARS outbreak in Toronto. Canadian and international reports on the SARS response identified a number of issues including: uncoordinated leadership; a lack of outbreak management protocols; inadequate infectious disease tracking and outbreak management software; poor communications; insufficient physical and human resources; and, critically, that federal involvement in Ontario was limited by the lack of a delineated role within the organisational structure (Low, 2004; National Advisory Committee on SARS and Public Health, 2004). Uncoordinated leadership (federal-to-provincial-to-territorial) had previously been implicated in the 2000 Walkerton, Ontario, outbreak of waterborne gastroenteritis¹³.

PHAC is accountable to the Minister of Health and does not have a protected funding stream, and the Chief Public Health Officer has no protection from dismissal, which creates the perception that they cannot act independently (Branswell, 2014; Wilson & Keelan, 2008). In 2008 a foodborne listeriosis outbreak just prior to Canada's 2008 federal election resulted in concerns that the nation's Chief Public Health Officer and Public Health Agency (PHAC) failed to respond appropriately due to political pressure (Wilson & Keelan, 2008).

New Zealand

Two examples from New Zealand are relevant to this discussion: the Public Health Commission (1991-1994) and Health Promotion Agency (2012-current). The Public Health Commission was formed amidst far-reaching health reforms in New Zealand in the 1990s. The Public Health Commission was created as an arms-length crown entity 'to overcome problems of inadequate co-ordination, lack of national focus and lack of an identified responsibility for public health' (Upton, 1991, p.110-11). After a short but productive life, the Public Health Commission merged back into the Ministry of Health in mid-1995, at least in part because of 'unpopular' policy advice on the social and economic determinants of ill health, forceful lobbying by the alcohol and tobacco industries, and shifting ministerial preferences (Skegg, 2019).

¹³ This outbreak resulted from the contamination of the water supply of Walkerton with *E. coli*. It was determined that both organisational negligence and negligence by individuals had led to the six deaths and to more than two thousand people becoming ill.

The second example from New Zealand, the Health Promotion Agency, is a Crown Agency established in 2012 which focuses largely on health education with an emphasis on social marketing, although it also inherited alcohol research and policy responsibilities from the former Alcohol Advisory Council. The Health Promotion Agency was intended to provide a more efficient approach to health promotion, and in turn deliver better public health. The Health Promotion Agency has been relatively successful in terms of longevity (more so than the ANPHA), but has been limited in its capacity to institutionalise preventive health beyond its initial tightly defined remit on health promotion especially via social marketing (Boswell et al., 2019).

England

Relative to the Australian, Canadian, and New Zealand examples above, Public Health England has a large scope and capacity, and a reputation for independence and legitimacy, as well as a relatively high level of agreement and cooperation across political parties (Boswell et al., 2019). The agency engages in controversial issues (e.g., e-cigarettes) but is careful to follow established protocols of independent advice. Overall, Public Health England has greater capacity and a larger budget than its counterparts (at least in Australia and New Zealand), and has more discretionary resources to dedicate to preventive issues.

Overall findings

The experiences of the ANPHA, PHAC, the HPA, and the Public Health Commission show that the success of stand-alone agencies dedicated to prevention may be tenuous. Failure to maintain a balance between the degree to which an agency engages in controversial political issues, the size or sphere of activity, and the agency's perceived legitimacy, can limit this type of agency's success (Boswell et al., 2019; Flinders, Dommett, & Tonkiss, 2014). In particular, a focus on the major causes of preventable non-communicable diseases (tobacco, alcohol, and obesity) tends to invoke staunch industry resistance, which such agencies may be ill equipped to oppose (Boswell et al., 2019). Ongoing support for such agencies can be subject to shifting ministerial preferences (Skegg, 2019).

Leadership

Many authors (Atkinson et al., 2008; Craig, 2011; Moloughney, 2006; Naylor, 2003; Skegg, 2019) have commented on the importance of strong clinical leadership¹⁴ with a clear vision of what public health should achieve. In particular, a lack of clinical leadership in public health was identified as contributing to an inappropriate response to the SARS pandemic in Canada (Naylor, 2003), and as inhibiting the delivery of an equitable and comprehensive public health service in Brazil (Atkinson et al., 2008) and parts of the United States (Mays & Smith, 2009).

Although the main theme from the literature is the importance of strong leadership, there are also some examples of possible clinical leadership models. In their review of the Canadian public health system, Naylor et al. (2003) identified five different models of clinical leadership for public health:

- Independent “Surgeon General”
- Officer of Parliament
- Chief Public Health Officer in organisation outside of government
- Chief Public Health Officer within a government department, and
- Government department without an individual responsible for clinical public health leadership.

The following sections provide a summary of the discussion of each of these models in Naylor et al. (2003). The models are discussed as though clinical leadership will be provided by an individual with public health clinical expertise. However, in some models a committee or board may be able to adopt a similar role. Furthermore, it is feasible to adopt more than one of the models simultaneously (e.g. a “Surgeon General” could provide independent advice while a Chief Public Health Officer provides direct clinical leadership).

Independent “Surgeon General”

In the “Surgeon General” model, an individual (with supporting staff) is appointed to provide public health leadership and advice to government, health authorities, and the public. No one is accountable to the Surgeon General, which means that although they can provide recommendations and have moral authority, they have no formal authority to enforce their recommendations. The lack of formal authority may be a particular concern when rapid, decisive clinical action is required, for example to coordinate a response to a public health emergency. On the other hand, the lack of formal authority protects the Surgeon General from conflicts of interest as their personal performance is not assessed on the performance of the health system they monitor. Furthermore, it is easier to provide protection from dismissal (e.g. as for the Auditor General) for an advisory position than for a position with formal authority, so a Surgeon General model is likely to provide greater independence than other models of public health leadership.

Examples of the Surgeon General model include the Surgeon General in the United States, and the national public health advisor board proposed for Canada (but not adopted) by Naylor et al. (2003).

¹⁴ In the context of this review, clinical leadership indicates leadership and decision making directly related to public health practice. It excludes administrative or financial leadership and decision making. For example, deciding how to respond to a disease outbreak would be a clinical decision, whereas deciding who to hire to fill a position would not be a clinical decision.

Public Health Officer of Parliament

A Public Health Officer of Parliament would be a similar role to a Surgeon General, but with different legal protection (similar to the Prime Minister's Chief Science Advisor). Compared to a Surgeon General, a Public Health Officer of Parliament would have a greater emphasis on advising parliament rather than public health agencies or the general public. An Officer of Parliament may be a more appropriate advisory position for jurisdictions where the central public health agency remains within a government department under direct control of a minister, rather than a separate agency with some independence from government.

Chief Public Health Officer

A Chief Public Health Officer would lead a central public health authority and would be ultimately responsible for the clinical performance of the public health system. Local public health authorities would be directly accountable to the Chief Public Health Officer, so this model provides authority for the officer to implement recommendations nationwide, and to direct coordinated responses to public health threats. However, a Chief Public Health Officer would be seen as less impartial than a Surgeon General, as they may be less likely to criticise their own agency or agencies they are responsible for. Furthermore, it may be difficult or undesirable to create legislation to protect the independence of an officer with the power to control the public health system.

The national public health authority led by the Chief Public Health Officer may be a government department or may be a separate agency with some measure of independence from government, as discussed in the National Public Health Authorities section of this review. Compared to a Chief Public Health Officer within a government department, a Chief Public Health Officer in an agency outside of government is more likely to be able to act independently and be able to provide criticism of government policy, but may be less able to influence the formation of government policy.

No independent clinical leadership role

Public health systems may be led by a national public health authority without an independent individual or group in a dedicated clinical leadership role. This arrangement in Canada prior to 2003, where public health was led by the Canadian Ministry of Health, led to the criticism that it “puts public health professionals inside a very large organisation and a highly process-oriented culture with a particular orientation to the political issues of the day” (Naylor, 2003), which limits ability of leaders to provide unbiased criticism, prevents transparent decision making, reduces public trust, and creates an inflexible working environment which deters the best employees (Naylor, 2003). This situation led to the establishment of the Public Health Agency of Canada, as mentioned earlier in this review.

New Zealand's Director of Public Health

New Zealand's Health Act (1956), as well as requiring the Director-General of Health to produce an annual report on the current state of public health in New Zealand, requires him or her to appoint a Director of Public Health, a statutory role falling somewhere between the models described by Naylor (2003). The Act describes the Director's role as “advising the Director-General on matters relating to public health, including personal health matters and regulatory matters relating to public health”. The Director of Public Health may also advise or report directly to the Minister of Health on any matter relating to public health, although Skegg (2019) notes that the Director's power to advise or report independently to the Minister does not appear to have ever been exercised.

Local leadership

While the choice of national leadership *model* is a key aspect of a public health system's configuration, the practical implementation of collaborations and joined-up-work typically relies on local leadership and other dedicated staff, through the provision of guidance, support, training, and resources (Guglielmin et al., 2018). Studies of joined-up government approaches in public health suggest that strong leaders are important at all levels, and without champions, the 'joined-up ethos' can fail to take hold (Carey, Crammond, & Keast, 2014, p.9). It has been argued that achieving desirable community-level outcomes greatly depends upon the width and depth of 'decision space' at the local level (Bossert, 1998). Strong leadership involves partnerships and opportunities for dialogue between national and local actors (Fryatt et al., 2017), with an emphasis on ownership, accountability, participation, and policy capacity (Greer, Vasev, & Wismar, 2017).

Core Functions

Some jurisdictions have developed a set of core public health functions to help define the minimum level of public health services that need to be provided in a modern public health system (British Columbia Ministry of Health, 2005; Moloughney, 2006; Ontario Minister of Health and Long-Term Care, 2015; "Quebec Public Health Act," 2001; Williams et al., 2015).¹⁵ The high level core functions are often further interpreted to define a lower-level set of "essential public health services" (e.g., the CDCs 10 essential public health services, Box 3), which provide more precise direction for public health services, and take into account the context in which the core functions are carried out. Some jurisdictions have only the lower-level "essential services" without the higher level "core functions" (Australian National Public Health Partnership, 2000; United States Centers for Disease Control and Prevention, 2014). Highly integrated public health systems rely on many organisational partners to perform these essential public health activities (Mays et al., 2010).

The literature describes three main models for embedding core function frameworks to guide public health service delivery:

- public health core functions are mandated in legislation (e.g. "Quebec Public Health Act," 2001)
- public health core functions are 'recommended' and associated with funding and reporting to a central public health agency (e.g. Australian National Public Health Partnership, 2000; British Columbia Ministry of Health, 2005; Moloughney, 2006; Ontario Minister of Health and Long-Term Care, 2015), or
- public health core functions are assessed by a voluntary audit system (e.g. United States Centers for Disease Control and Prevention, 2014).

One key difference between these three models is the level of reliance on top-down control and accountability. The first model is heavily reliant on prescribed service specifications and tight accountability, while the two other configurations delegate considerable responsibility to decentralised organisations (see also the discussion on centralisation vs. decentralisation, page 6).

While the literature provides some discussion on how core function frameworks are used (e.g., to guide service delivery, build organisational capacity, improve quality, improve the measurement of outcomes, and to strengthen accountability), there is little discussion of the relative merits of one particular model over another.

¹⁵ In New Zealand, the Ministry of Health, public health units, and other non-government organisations (NGOs) collectively perform five core functions of public health (*assessment and surveillance, public health capacity and development, health promotion, health protection, and preventive interventions*).

Summary

This review identified six themes in the discussion of public health service configurations in different jurisdictions:

- 1) The spectrum between centralised and decentralised systems of control and accountability.
- 2) The association between local public health authorities and local government.
- 3) The size of the population covered by a single local public health authority and the efficient delivery of services.
- 4) The association between national public health authorities and national government.
- 5) The importance of strong leadership and a clear vision for public health.
- 6) The range of models used to ensure that core public health functions are implemented.

1) In regard to public health system configurations, the degree of decentralisation appears sensitive to political, administrative and financial influences, and systems tend to waver on the centralised–decentralised spectrum with successive rounds of reform. Shifts in the direction of decentralisation are largely driven by the premise that decentralisation enhances the width and depth of the ‘decision space’ (Bossert, 1998), improves inputs, management processes and health outcomes, and allows local public health authorities greater autonomy to tailor their service to the needs of local populations. However, decentralisation, even with a moderate-to-strong levels of accountability, can still result in localised variability in strategic approaches, in funding availability, and in the equity of outcomes within jurisdictions. The best examples of decentralised configurations retain central strategic control, yet allow local autonomy of implementation and provide non-competitive central funding.

2) Locating local health authorities within local government may encourage a close working relationship between public health and other local government authorities, when these transitions and relationships are managed well, which may allow greater influence over social determinants of health. However, the desirability and feasibility of such shifts likely depends on the pre-existing responsibilities of the different public health and local government agencies, and their ‘scopes’ within social care. Further, the desired benefits may be difficult to realise in areas with two-tier local government, and the influence of local government may also politicise public health, all of which can lead to funding and service provision inequalities between regions.

3) Local public health authorities seem to perform best when serving populations of greater than 100,000 people. However, at some point, the economies associated with delivering public health services to large populations may erode because of the difficulties of managing multiple programs and activities for numerous demographic and geographic subgroups within the population. Consolidation of smaller public health authorities could increase efficiencies, although the literature does not comment on the effect of consolidation on equity within public health authority boundaries.

4) National public health authorities may be included as part of government or may be a separate agency with some measure of independence from government. Establishing an agency at arms-length from government may increase credibility, decrease the politicisation of public health,

improve the coordination of resources, provide leadership and momentum, and influence decision-makers. However, some studies suggest that it is difficult to establish an agency that is sufficiently independent to achieve these aims. Further, while an agency's viability may be readily improved by optimising factors such as structure, funding and leadership, this does not necessarily improve its effectiveness in modifying population health. Success appears to rely on a difficult-to-achieve balance between salience, scope and standing.

5) Strong clinical leadership is important to public health performance regardless of public health service configuration. Leadership models range from a *Surgeon General* approach (full autonomy but little authority) to a *government department* approach (little autonomy but full authority). A lack of clinical leadership has been identified as contributing to inequitable service delivery and poor response to emergency situations. The literature does not identify any particular national-level leadership model as having a clear-cut advantage overall. Strong local-level leadership is also important. The practical implementation of joined-up-work typically relies on local leadership and dedicated staff, and without champions the 'joined-up ethos' can fail to take hold. Strong leadership involves partnerships and opportunities for dialogue between national and local actors.

6) Many jurisdictions have developed a set of core public health functions to help define the minimum level of public health services that need to be provided in a modern public health system. This review revealed three models for embedding core function frameworks to guide public health service delivery. These different models predominantly employ either *mandated* (set in legislation), *recommended* (linked to funding) or *voluntary* (based on accreditation) approaches. The literature reviewed revealed no discussion of the relative merits of the different ways core functions could be used.

Conclusion

Public health systems in many developed countries have undergone multiple rounds of reform over the last 20-30 years. In part, this is because prevention efforts made by public health entities often come up against conflicting political views and values, powerful corporate interests, funding pressures, and competing priorities within health systems.

While there is little in the literature to suggest one "ideal" configuration for a public health system, there is some evidence and much reflection on aspects of system configuration that can enhance or inhibit public health's effectiveness. It is also clear from the literature that effective public health delivery depends not only on system structure, but on the complex interactions between structure and other key system features, including history, capacity, credibility, leadership, workforce, and degree of fit with other social and political structures.

In the current New Zealand context, public health system reforms are most likely to be successful if they build on strengths, increase capabilities, understand the limitations of context, and focus on how best to leverage the social determinants of health – in the pursuit of population health and health equity.

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