



## Public health reimaged

The COVID-19 pandemic has shifted the dynamics of public health. The scope and persistence of this global crisis have exposed vulnerabilities in countries' public health systems and impacted their ability to effectively detect and respond to the continually shifting emergency in a multidimensional way that could have mitigated its impact. Despite some successes (New Zealand and South Korea, for example), many nations' systems for disease surveillance, outbreak management, and contact tracing and tracking have proved inadequate for the scale of the pandemic's initial and subsequent outbreaks. The public health workforce has been placed under significant, prolonged pressure, resulting in widespread burnout and post-traumatic stress—especially in countries where workforce shortages were already an issue pre-pandemic—exacerbated by difficulties in contact tracing, data collection and analysis, mass vaccination planning, logistics, distribution, and storage.

At the same time, the pandemic is acting as a catalyst to reimagine the future of public health: It is about the health of the population, not an individualistic model. The pandemic has awakened government, industry stakeholder, and consumer awareness of public health systems' inherent challenges and broadened understanding that achieving drastically improved health outcomes requires systemic change and cross-sector coordination.<sup>1</sup> Challenging forward progress—in addition to the ongoing pandemic—are the growing threat of climate change and pervasive inequities that threaten individuals' health, longevity, and trust in government.<sup>2</sup>

The pandemic has ignited growing recognition of the need to invest in population health. We are only as strong as our most vulnerable populations, and early health promotion, detection, and intervention are essential to prevent, reduce, or delay the onset of chronic disease.

## What is public health?

Public health is defined as “the art and science of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private communities, and individuals.”<sup>3</sup>



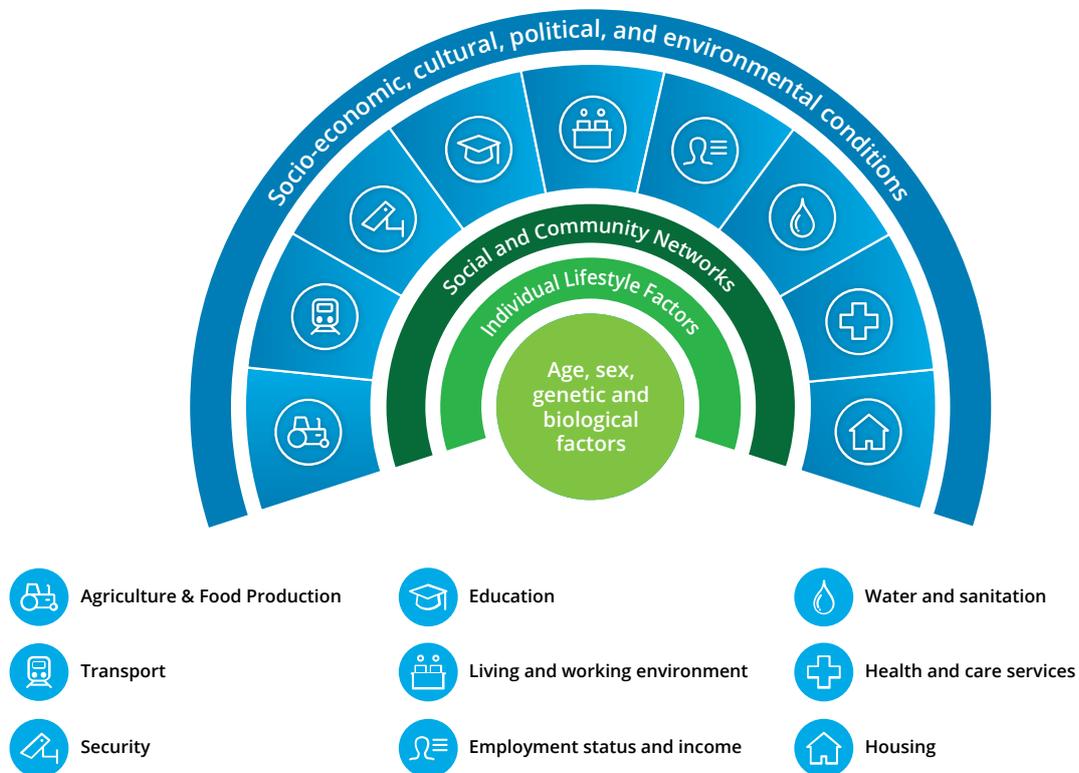
## The funding conundrum

COVID-19 treatment delivery has been almost entirely borne by the public sector, and nearly all governments have or are expected to introduce public health policies and spend heavily in 2022 (and, likely, in subsequent years) to control the pandemic, broadly roll out vaccine programs,<sup>4</sup> and offset its health- and economic-related fallout.<sup>5</sup> The U.S. federal government, for example, has passed several pieces of legislation providing economic relief through a number of channels and programs, a large portion of which is targeted not just at responding to and recovering from the pandemic, but also toward overall modernization efforts in public health. The United Kingdom has reformulated its entire approach to public health, including creating new responsible organizations and enhancing integration of health and social care.<sup>6</sup>

The core mission of public health is to protect and promote the health of all people in all communities. However, adding COVID-related expenditures to public health's other challenges—climate change, health inequities, communicable and noncommunicable diseases, deteriorating infrastructure, and a global shortage of clinical workforce—will require new partnerships across public and private health care providers. It will also depend on disruptive entrants bringing new ideas and diverse skillsets, and new sources of investment to promote shared aims of prevention and wellness for communities. The latter would be a paradigm shift from the traditional emphasis on providing sick care for individuals<sup>7</sup> that is expected to help improve outcomes and control and/or reduce system costs now and in the future.

A strong foundation for the future of public health will be dependent on whole-of-government approaches to care provision and collaborative, multi-stakeholder ecosystems.<sup>8</sup> Thus, public health systems are working to navigate the challenges of linking community and clinical services to improve health outcomes in the long term;<sup>9</sup> Italy's National Health Service is one example of public health-health care integration.<sup>10</sup> Numerous studies suggest that between 30% and 55% of health outcomes are affected by social, economic, and environmental factors:<sup>11</sup> these social determinants of health (SDOH) include physical environment, food, infrastructure, economy, wealth, employment, education, social connections, and safety<sup>12</sup> (figure 1). Effectively tackling this will require integrated approaches to health, housing, education, transportation, and employment.

Figure 1. Social determinants of health



Note: Social determinants are known as the “causes of the causes” of ill health, and encompass the range of social, environment, political and cultural differences that directly or indirectly impact the health of individuals and populations; and are recognised globally as a core dimension of public health policy and practice and are central to action on health inequalities.

Source: The future of public health, Deloitte UK

Numerous countries are implementing innovative programs to move public health in the right direction. New Zealand has instituted a well-being budget based on the idea that gauging the long-term impact of policies on the quality of people’s lives is better than focusing on short-term output measures. The initiative is focused on aiding the transition to a sustainable and low-emissions economy; supporting a thriving nation in the digital age; lifting Māori and Pacific incomes, skills, and opportunities; reducing child poverty; and supporting mental health for all New Zealanders.<sup>13</sup>

Brazil established the Support Program for Institutional Development of the Unified Health System (PROADI-SUS), a collaborative of six private hospitals (Hospital Alemão Oswaldo Cruz, Beneficência Portuguesa de São Paulo, Hospital HCor, Hospital Israelita Albert Einstein, Hospital Moinhos de Vento and Hospital Sírio-Libanês) that aims to strengthen and develop their relationship with public health departments and meet the needs of the Unified Health System (SUS).

The United Kingdom’s planned reform of public health brings all health care providers into a new, geographically based Integrated Care Service (ICS) beginning in April 2022 and enhances integration of health and social care within the ICS structure. In addition, the plan will close Public Health England (PHE) and split its responsibilities across a new UK Health Security Agency (UKHSA) and the Office for Health Improvement & Disparities, part of the Department of Health and Social Care. The arrangement provides a unique opportunity to re-prioritize public health protection, prevention, and promotion services and address health inequalities in more coordinated and collaborative ways.<sup>14</sup>

## Digital technologies are transforming public health systems

Numerous public health systems are reinventing themselves in the wake of COVID-19, and digital technologies—from targeted applications to entire smart cities (see sidebar)—are playing an important role in their transformations. While the challenge is enormous, so is the opportunity.

Digitizing public health and other government systems has emerged as a pressing issue in Japan, where the country's ministries and agencies have created siloed legal and regulatory systems, and an outdated information technology (IT) infrastructure has hampered data collection. A “digital agency” was established on September 1, 2021, to close the technology gap.<sup>15</sup> In addition, Japan's health ministry put into full-scale operation an online system for citizens to use My Number social security and taxation identification cards as public health insurance cards.<sup>16</sup> In addition, card holders will be able to access their personal health record (PHR), including medical history and check-up results. The centralized data will become available for industry use, creating needs for increased data security.

Germany has also lagged in health care digitization, despite having the world's second largest health care market after the United States. The pandemic highlighted the importance of digital health and the need to modernize the country's hospital system.<sup>17</sup> In response, the federal parliament passed the Hospital Future Act (KHZG) to provide significant funding (US\$ 4.3 billion) to close the digital gap. Potential projects include patient portals, digital medication management, IT security measures, telemedicine, robotics, and cross-sector telemedical network structures.<sup>18</sup>

In China, government policies, markets, the pandemic, and new technologies are promoting the digitalization of public health services including medical care, health insurance, health monitoring, online consultations, diagnosis, prescriptions, payment, and reimbursement. 5G telecommunications, leveraging the ubiquity of mobile technology use—China has the largest number of mobile telecom users in the world with 1.2 billion subscribers, 239 million of which use health-related applications or services<sup>19</sup>—is anticipated to be a key contributor to public health service and innovation.

While Southeast Asian (SEA) countries' public health systems have varying resources at their disposal, it became clear during the COVID-19 crisis that a coordinated regional response is needed to manage future pandemic threats. With support from the United States Agency for International Development (USAID), the Association of SE Asian Nations (ASEAN) is establishing the Public Health Emergency Coordination System (APHECS). This new multi-year multi-country initiative will integrate existing but disparate systems and mechanisms under a single, cohesive institutional platform to better prepare for, and respond to, public health emergencies.<sup>20</sup>





## Smart cities can make health care smarter

Smart cities have moved from vision to reality, and are already helping to improve citizens' health and quality of life, solve key urban challenges, and create safe and sustainable surroundings.<sup>21</sup>

A smart city is a technologically modern urban area that uses information and communication technologies (ICTs)—embedded sensors, metering devices, cameras, and other monitoring technologies—with big data processing and artificial intelligence (AI) to collect specific data to help manage public assets, resources, services, and spaces.<sup>22</sup> A smart city can make health care smarter when systems and data are integrated and interoperable across core health, human services, and non-health sector services, including public safety, environmental health, social services, emergency services, and transportation. This can help enable real-time response to health crises, address inequities around the social determinants of health, and support the interconnected health and wellness goals of communities across the globe.<sup>23</sup>

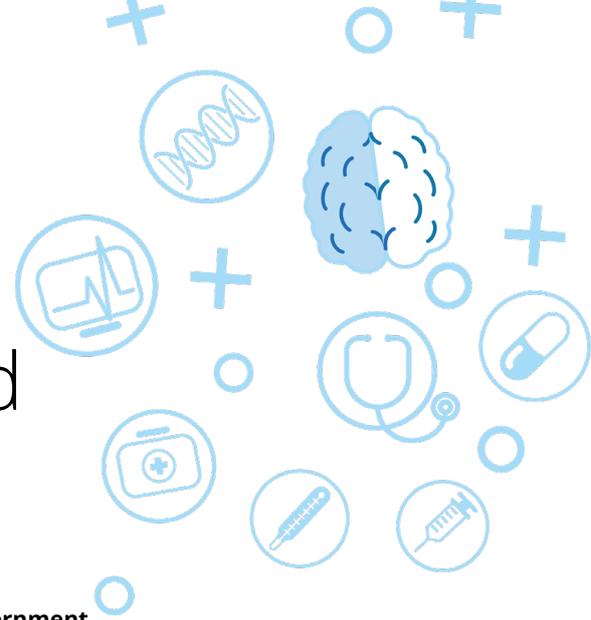
The most exciting aspect of smart cities is that they provide a blank canvas to reimagine public health, integrate well-being into urban design from the outset, and proactively address the social determinates of health care. A number of countries are at the forefront of smart cities development:

- **China** has become a global leader in smart cities initiatives, elevating development to a national strategy and allocating extensive government resources into furthering its growth. The nation reportedly has nearly 800 smart cities pilot programs underway or in planning, which would total more than half of the total smart cities around the world.<sup>24</sup> Municipal authorities charged with smart cities development commonly cite transportation, public services, public safety, education, health care, and environmental protection as project focus areas. Shanghai, Beijing, Guangzhou, Xi'an, Yinchuan, and Hangzhou are notable examples of older urban areas that have received smart city makeovers. In Hangzhou, a smart city system designed by Chinese tech giant Alibaba called "City Brain" has been in use since 2016.<sup>25</sup> China's central government is also promoting its smart cities technologies abroad.<sup>26</sup>
- **The United Arab Emirates** is an early and prolific developer of smart cities. Masdar City in the emirate of Abu Dhabi was launched nearly a decade ago as the first smart sustainable city in the UAE and among the first in the Middle East region.<sup>27</sup> Dubai, UAE, has transformed itself into a model smart city in just three years, revolutionizing the way government services are delivered to residents by launching over 100 smart initiatives and more than 1,000 smart services by two dozen government departments and private sector partners. Its vision is for Dubai to be "the happiest city on earth."<sup>28</sup> One of the six targets of the Smart Dubai 2021 initiative is an interconnected society with easily accessible social services, which includes "improving individuals' quality of life by embracing technology to streamline social, cultural, education, and health care experiences in the Emirate."
- **Saudia Arabia** is building a futuristic, mega-city called NEOM or "New Future," in a desert bordering the Red Sea. Covering a total area of 26,500 kilometers/10,200 square miles, NOEM will incorporate smart city technologies and also function as a tourist destination. The state has pledged at least \$500 billion for the project, and is soliciting further investment. One of the infrastructure projects under development at NEOM is THE LINE, a 170-kilometer belt of hyper-connected, AI-enabled communities, without cars and roads, powered by 100% clean energy, and built around nature.<sup>29</sup> All essential daily services—schools, medical clinics, recreational facilities, and green spaces—will be within a five-minute walk. Ultra-high-speed transit and autonomous mobility solutions will make travel easier and give residents more time to spend on their health and well-being.<sup>30</sup> THE LINE's carbon-free energy system will provide pollution-free, healthier, and more sustainable environments for residents.<sup>31</sup>

Smart cities require infrastructure modernization—and that typically takes time and comes with a high price tag. Innovative financing strategies are helping national, state, and municipal governments transform their smart city vision into reality.<sup>32</sup> Many smart programs use a variety of public and private funding mechanisms to cover costs. Indeed, taking a community-based approach galvanizing public-private partnerships and other community assets is key to achieving smart transformation goals.<sup>33</sup> Public funds such as bonds or grants often provide the initial funds, with private sector funding such as loans, private equity, and philanthropy also viable funding sources.

The expansion of smart cities and their attendant technologies is expected to have major economic, health, and social impacts as troves of data are collected and used to improve the efficiency of government operations and individuals' daily lives. Still, where and in what ways countries and municipalities use the data that smart cities collect is a concern. Technologies that gather and synthesize real-world, real-time personal data can easily be used to threaten personal privacy or even national security.<sup>34</sup> Robust data security and governance will be essential elements of smart cities blueprints.

# Questions/actions health care leaders should consider for 2022



**COVID-19 has produced unique opportunities—both in public attention and government financial support—to confront longstanding issues underlying public health. How can stakeholders capitalize on current momentum to reimagine public health for the future?**

Public health systems face persistent clinical, financial, and technology challenges across the service ecosystem—all exacerbated by heightened demand and skyrocketing costs during the pandemic—with a net impact of underserved clients and uneven outcomes across the range of support for vulnerable individuals and families. There is an unquestionable need to reimagine and transform struggling and constrained public health systems into ones that are human-centered, inclusive, and resilient to future shocks. The following steps could help organizations advance toward a more sustainable future:

**Strengthen existing and establish new models of collaboration** across professional, institutional, and organizational boundaries. Public health systems should work closely with the private and nonprofit sectors, although public health agencies do not need to be at the center of all activities in the ecosystem that improve health outcomes. Public health leaders can begin by assuming the role of convener, nurturing new and budding relationships with ecosystem partners to improve processes and innovations, as well as strengthening collaborative infrastructures across offices and agencies.

**Clearly articulate a shared value proposition.** Shared value is created by cross-sector investment in public health and based on timely and transparent evaluation and measurement of public health initiatives. Public health communication will be critical to defining shared value, and community co-design will generate shared stewardship and strengthen trust. Public health leaders can quantify the business case for public health investment, include community members in public health decision-making from the start, combat mis- and disinformation like it is a national security threat, and borrow from the commercial sector to employ effective communications strategies.

**Align funding and incentives with prevention, health promotion, and wellness.** Public health funding models should include mechanisms to streamline the current patchwork of government support, private equity funding, social impact investing, public health trusts, community development financial institutions, and environmental, social and governance (ESG) investments. Public health leaders can start by leveraging existing and untapped funding sources, incentivizing provider and insurer investment in prevention, and capitalizing on next-generation financial investment models that could promote health.

**Share data across sectors, in real time.** Public health data systems should enable cross-sector, real-time data-sharing, with public health data sets forming longitudinal data that cuts across public health concerns. A country-level vision should articulate the architecture and data standards, with regional/municipal data governance organizations overseeing traditional, nontraditional, and self-reported data collection. Public health leaders can join growing networks to enable real-time data sharing, leverage existing research tools, and extend the reach of current resources through automated technology.

**Center future public health around health equity.** Achieving health equity requires closing the opportunity gap, placing equity at the center of public health aims, incorporating health equity measures into public health initiatives from the start, and infusing diversity, equity, and inclusion (DEI) into all aspects of the workforce. Public health leaders cannot tackle equity alone; however, they can kickstart efforts by empowering community partners to lead change, building health equity metrics into funding and national guidelines, and galvanizing communities to advocate for equitable fiscal policy as a public health imperative.

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# Endnotes

1. The future of the public's health: Reimagining the health ecosystem: Programs, Policies, and Systems for strengthening public health, <https://www2.deloitte.com/us/en/insights/industry/health-care/the-future-of-public-health.html>.
2. Ibid.
3. Narrowing the gap: Establishing a fairer and more sustainable future for public health, [deloitte-uk-future-of-public-health-narrowing-the-gap.pdf](#).
4. World Industry Outlook: Healthcare and pharmaceuticals, Economist Intelligence Unit, February 2021.
5. Ibid.
6. Narrowing the gap: Establishing a fairer and more sustainable future for public health [deloitte-uk-future-of-public-health-narrowing-the-gap.pdf](#).
7. The future of the public's health: Reimagining the Programs, Policies, and Systems for Strengthening Public Health
8. The future of public health: Personalized, participatory, predictive, precise (deloitte.com).
9. [us-lshc-addressing-social-determinants-of-health.pdf](#) (deloitte.com).
10. <https://www.ncbi.nlm.nih.gov/books/NBK507328/>.
11. [Social determinants of health](#) (who.int).
12. Elizabeth Baca, "No one should be surprised that low-income populations are being hit harder by COVID-19: How do we achieve health equity?," Deloitte Health Forward blog, 15 October 2020.
13. [New Zealand has unveiled its first 'well-being' budget](#) | World Economic Forum (weforum.org).
14. Narrowing the gap: Establishing a fairer and more sustainable future for public health [deloitte-uk-future-of-public-health-narrowing-the-gap.pdf](#).
15. [Suga's \\$1tn budget proposal to target digitizing government - Nikkei Asia](#), 1 October 2020.
16. [Japan Starts My Number Card Use for Health Insurance](#) | Nippon.com, 20 October 2021.
17. [German hospitals to get €3 billion funding boost for digitalisation](#) | Healthcare IT News, 22 September 2020.
18. Ibid.
19. Covidmonitoring impact.
20. [USAID PROSPECT APHECS 2021 Fact Sheet \(website-final\) 5](#) (usmission.gov).
21. [Smart Cities of the Future](#) | Deloitte US.
22. [Smart Cities of the Future](#) | Deloitte US.
23. Ibid.
24. [Microsoft Word - China Smart Cities Development Report.docx](#) (uscc.gov).
25. [Are China's Smart Cities Really Surveillance Cities?](#) | Cities | US News, 31 January 2020.
26. [Microsoft Word - China Smart Cities Development Report.docx](#) (uscc.gov).
27. [Developing sustainable smart cities in the UAE - My ITU](#), 24 August 2020.
28. [Smart Dubai 2021](#).
29. [HRH Prince Mohammed bin Salman announces THE LINE at NEOM](#), 10 January 2021.
30. Ibid.
31. Ibid.
32. [Smart Cities Funding and Financing Strategies](#) | Deloitte.
33. [Smart Cities Funding and Financing Strategies](#) | Deloitte.
34. [Microsoft Word - China Smart Cities Development Report.docx](#) (uscc.gov).



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