

Maximizing Healthy Life Years: Investments that Pay Off

An Insights Report from the World Economic Forum's "Future of Healthy" Project
Prepared in collaboration with Bain & Company

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Executive Summary

In times of economic uncertainty and slow growth, it is more important than ever for economies to find alternative ways to gain a competitive advantage. Healthy individuals and healthy populations can create a competitive advantage through increased productivity, reduced healthcare costs and overall higher levels of well-being.

Non-communicable diseases (NCDs) are a key threat to a population's health and therefore to its economic growth. The negative effect of these chronic diseases is undeniable. An unhealthy population is expensive – for governments, for businesses, for communities and for individuals. Globally, \$47 trillion of cumulative output will be lost between 2012 and 2030 because of the impact of NCDs and mental disorders (World Economic Forum and Harvard School of Public Health, 2011).

The ecosystem of health is complex, but also full of opportunities for bringing populations to healthier states and realizing the respective socio-economic gains that this will deliver. Investments in the primary prevention of NCDs, built on robust primary healthcare infrastructure and efforts to maximize “healthy life years”, will bring positive health and economic returns. For example, Singapore's Health Promotion Board subsidizes healthier cooking oil for use in meals outside the home, a move which is expected to reduce the number of cases of coronary heart disease by 2020 and generate a return on investment (ROI) of 1100%. Meanwhile, Columbia University has estimated that China could generate a 90% ROI by implementing air and water protection mechanisms to reduce the health effects of pollution. Investments at the right inflection point in the life cycle involving stakeholders from across diverse sectors can generate superior economic returns, thereby justifying the investment.

Public and private stakeholders can realize a return from investing towards healthier populations. Various methodologies are available to quantify the benefits and returns of a healthy population and all have their advantages and disadvantages. Understanding what businesses, governments and societies at large have to gain from investing in health requires an approach that assesses full societal costs and full societal benefits of healthy populations.

The concept of maximizing healthy life years to assess the link between healthy populations and economic growth can provide a pragmatic approach to assessing the full range of costs and benefits societies face. By living healthier lives, communities nurture “**virtuous cycles of health**” – recurring

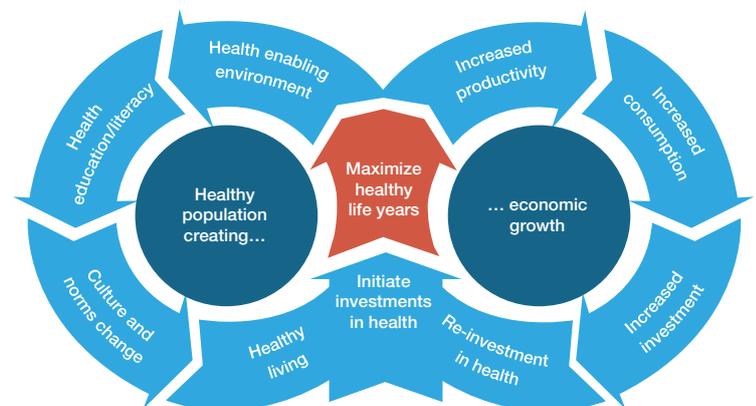
cycles of events, with the result of each one increasing the beneficial effect of the next – that fuel both health and growth.

This report, part of the “Future of Healthy” project, includes:

- A systems map depicting the complex ecosystem influencing healthy populations
- Key inflection points for investment in healthier societies, extracted from an analysis of the systems map
- Examples of investments at these inflection points that have resulted in positive health and economic returns
- Building blocks to rethink the concept of ROI for a healthy population

The report stresses the need for a new way of thinking about the ROI of healthy populations. The ROI can be regarded from an **individual perspective (iROI)** as well as from a **population/societal perspective (pROI)**. It is critical to bring all relevant stakeholders together to create a common understanding of the value of healthy populations in order to attract private and public investment. Increased investment in health will also come from a common understanding of sustainable business models that can be used to share the positive returns from healthy populations and of the roles of each party in driving these models.

Figure 1: A Virtuous Cycle: Healthy Life Years as a Source for Continuous Economic Growth



Source: World Economic Forum, Bain

1. Health is Fundamental to Socio-Economic Growth

Healthy societies have a competitive advantage that fuels productivity

Few will dispute the notion that healthy populations are the foundation of sustainable economies. Healthy populations are more productive, generating higher returns for their employers and more steady tax revenues. Healthy workers also incur fewer costs for their employers and their respective healthcare systems.

Being healthy gives children an advantage early in life. Healthy children enter school with physical and cognitive advantages, miss fewer days of school and attend school for more years, setting them up to achieve higher levels of education (World Economic Forum and Harvard School of Public Health, 2014).

A healthier workforce is more productive. Typically, worker levels of concentration are higher, ensuring higher quality results, achieved in a shorter time period (World Economic Forum and Harvard School of Public Health, 2011). Furthermore, a healthy population is able to work for a greater number of years before retirement, contributing more to the social welfare system and depending less on the benefits it offers.

To show the positive impact of population health on economic growth, the link between the level of investment in the health of a society and the savings rate of individuals can be considered. In countries where the government invests relatively little in health, people tend to save more money for unforeseen sickness, as this may need to be paid for out of pocket. The higher the savings rate, the lower the level of consumption. A study of the Chinese government's investment in health and its effect on household consumption shows that for each yuan of increased government spending on health, the associated household consumption increased by two yuan (Barnett and Brooks, 2010). This illustrates the multiplier effect of investing in a population's health, which contributes to economic growth through increased individual consumption.

An increase in total life expectancy can also have positive effects on a country's economic prosperity. Populations that live longer are productive over a longer time period and consume more during that extended life. According to the 2013 report by the Lancet Commission on investing in health, about 11% of economic growth in low-income and middle-income countries is due to reductions in mortality, as measured in their national income accounts (Jamison et al., 2013).

Unhealthy populations are expensive for governments, businesses and families

Given the increasing burden of NCDs and mental illness, it is obvious that unhealthy populations are expensive for governments, businesses and each affected individual.

Unhealthy populations lead to increases in government expenditure, reductions in the amount of taxable household income on account of ill people withdrawing from the workforce and, through increased morbidity rates, greater numbers taking early retirement (as well as additional costs incurred by social support systems and families).

The growth in healthcare expenditure provides evidence for this trend. In 2012 global health care expenditure accounted for nearly 10% of global gross domestic product (GDP) (World Health Organization, 2014a). Over the past 50 years, the cost of healthcare has consistently outpaced economic growth in Organisation for Economic Co-operation and Development (OECD) countries, by an average of 2% (World Economic Forum, 2013). For example, in 2009 the direct medical cost in the United States attributed to obesity was \$152 billion (Milken Institute School of Public Health, 2013).

But poor health affects more than healthcare expenditure. Unhealthy people require more sick days compared with their healthy colleagues, and during the time when they are at work, they are less productive. The associated productivity loss is considerable. For example, obesity-related absenteeism costs US employers as much as \$6.4 billion annually (Milken Institute School of Public Health, 2013).

Unhealthy populations are also more vulnerable to poverty and economic losses. One hundred million people globally have been pushed below the poverty line because they have to pay for healthcare out of pocket (World Health Organization, 2010). Having to pay for healthcare treatment out of pocket is still the norm for most people, since they cannot afford insurance. If they or someone within their family needs treatment, the family's savings can be quickly depleted. People falling below the poverty line will then require social welfare support from the government, which has an impact on the economic development of that country.

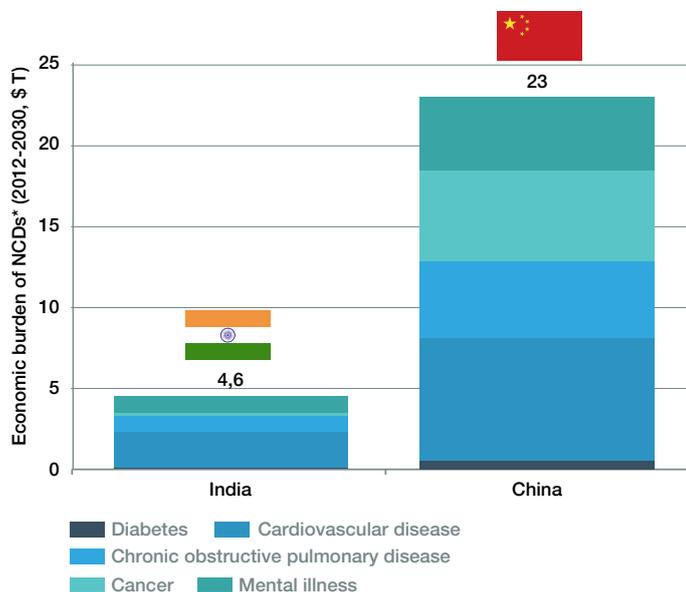
Family members and other caregivers also feel the impact of the illness of a family member. Family members may have to quit their jobs to care for a sick relative, resulting in the loss of another productive employee for the economy.

NCDs are a key threat to a population's health and economic growth

Chronic NCDs and mental disorders threaten more and more societies. Not only do these conditions have a negative impact on population health, they also limit economic prosperity. And despite common belief, this is not only a problem for high-income countries, but is also having an increasing and significant impact on low-income and middle-income countries.

For example, in India and China, the burden of the four major NCDs (diabetes, cardiovascular disease, chronic obstructive pulmonary disease and cancer) and mental illness is already significant. In India, around 60% of all deaths in 2012 were related to NCDs, with the number one most prevalent condition being cardiovascular disease. The total economic burden between 2012 and 2030 for India of all four major NCDs plus mental illness will add up to approximately \$4.6 trillion (World Economic Forum and Harvard School of Public Health, 2014). In China, the economic burden is even higher. Bearing in mind that the Chinese population is only slightly larger than the Indian population (1.4 billion compared with 1.3 billion in 2013), a total economic burden of around \$23 trillion between 2012 and 2030 is alarming. The largest share of the disease burden in China comes from cardiovascular disease, costing \$7.6 trillion, followed by cancer, with a cost of \$5.6 trillion (World Economic Forum and Harvard School of Public Health, 2014).

Figure 2: Total Economic Burden of NCDs in India and China Alone Will Reach \$28 Trillion by 2030



* Non-Communicable Diseases Source: World Economic Forum and Harvard School of Public Health, 2014

Stakeholders are starting to shift their attention to investment in health, but more needs to be done

Fortunately, investment in health has increased in the last few years. According to the World Bank, in 2005 almost \$5 billion was donated by non-profit organizations to international projects and development; of these initiatives, around one-third was health-related (Fuster, 2014). The majority of third-party and charitable funding is shifting towards health as well, as demonstrated by the programme expenses incurred by the Bill & Melinda Gates Foundation. While health expenses represented 46% of their total expenditure in 2003, the corresponding figure reached 62% in 2011 (Bill & Melinda Gates Foundation, 2011, 2003).

If venture capital is a measure of private investment in health, it is clear that health is a priority for private investors as well. According to Rock Health, a major player in the field of health sector funding, venture capitalists poured a record \$2.3 billion into digital health companies in the first half of 2014, slightly more than the figure for the whole of 2013 of \$2 billion (Bailey, 2014).

In addition to organizational investment in health, individuals are increasingly demanding products and services from the health sector. Consumers want to manage their own and their families' health by seeking information from the internet, implementing diets that promote and sustain weight loss, or participating in exercise programmes that are customized to their individual objectives and financial budget (Bain & Company, 2013).

What all investors have in common is their demand for a return. The return does not always have to be measured in quantitative terms; there are qualitative returns as well. However, the willingness of the private and public sectors to invest depends on the right investment mechanisms being in place, on there being proof that those returns will materialize and on the existence of a business model that makes it possible to share the benefits. A key goal of the "Future of Healthy" project is to provide a framework to help identify concrete investment opportunities in the health ecosystem.



2. Methodologies to Quantify the Benefits of Healthy Populations

To be able to assess the ROI of investments in healthy populations, the tangible benefits need to be quantified.

The *World Development Report 1993*, entitled “Investing in Health”, was the first milestone publication aiming to show finance ministers that well-chosen health expenditure is not an economic drain, but an investment in economic prosperity and individual well-being. The report showed that the allocation of resources to cost-effective interventions for high-burden diseases offers a rapid and indeed cost-effective path to improvements in overall welfare (World Bank, 1993).

Several of the studies that followed focused on the cost-effectiveness of specific interventions (World Economic Forum and World Health Organization, 2011). However, most cost-effectiveness analyses based their benefit analysis and ROI calculation mainly on the impact of reduced healthcare costs.

Investing in healthy populations not only improves health, it is also an investment in prosperity, social and financial protection, and national security. The 2013 Lancet Commission on investing in health applied the “full income” approach to assess the full range of benefits generated through investments in health. In this approach, the return of health investments over time is determined by the growth in a country’s full income. Income growth is measured based on national income accounts plus the value of additional life years gained over the period. The intrinsic value of an additional life year is linked to each additional life year gained through the intervention. The Lancet Commission estimated that between 2000 and 2011, about 24% of the growth in full income in low-income and middle-income countries resulted from the value of additional life years gained. In South Asia, the annual value of the change in mortality was equivalent to 2.9% of the average income during the period 2000 to 2011, which was almost half the size of the value of the increase in GDP (Jamison, 2013).

While the Lancet Commission uses the value of additional life years as the primary metric for improved health outcomes, other metrics exist to assess the economic benefits of healthy populations. The “value of lost output” approach estimates the impact on GDP of mortality and morbidity, taking into account disability-adjusted life years (DALYs) resulting from certain health conditions. Applying this methodology, a recent report by the World Economic Forum and the Harvard School of Public Health assessed 12 selected interventions in India. Of those, five – namely screening (for hypertension), vaccination (against the human papilloma virus), reduced tobacco use and improving care for depressive and anxiety

disorders – were found to have the potential to generate sufficient returns to reach a target ROI rate of 15% (World Economic Forum and Harvard School of Public Health, 2014).

In 2003 the Department of Health and Ageing in Australia commissioned an epidemiological and economic analysis entitled “Returns on Investment in Public Health”. They built their analysis of the benefits of public health programmes on two pillars: savings in healthcare expenditure and improvements in personal health from living longer, higher quality lives. The savings in healthcare expenditure were measured based on detailed estimates of expenditure per disease. The value of longevity and improved health was assessed using the concept of the value of life. This statistical metric provided an estimate of the value of a life discounted to an annual figure (Department of Health and Ageing Australia, 2003).

It has become clear that the public and private sectors consider different parameters when assessing the ROI. The current debate about investing in health does not always address the specifics of multistakeholder investments. It can at times be difficult to assess investment opportunities for multiple stakeholders particularly if investments are done in the context of a multistakeholder collaboration or if the ROI for societies at large is difficult to quantify.

For the purpose of this report and the goal of moving from “healthy as a cost” to “healthy as an investment”, focusing on additional healthy life years seems to be the most suitable way of assessing the economic impact and the socio-economic potential of fuelling the virtuous cycle of healthy populations. “Healthy life expectancy” is a powerful indicator of population health and overall progress in improving population health, according to Salomon et al. (2012). However, as Salomon et al. show, between 1990 and 2010, healthy life expectancy increased relatively more slowly than total life expectancy as a result of more time lived in a state of disability.

The concept of disability-adjusted life years (DALY) can be used to quantify the time lived in an unhealthy state. If an intervention is able to prevent unhealthy years (i.e. DALYs), the economic benefits are worth the number of DALYs averted multiplied by an economic value of one DALY. Metrics such as the annual GDP per capita can be applied as this economic term (World Health Organization, 2001). This conversion of DALYs into economic terms is applied in most of the ROI calculations presented in Section 4 to illustrate the promising returns of investing in health.

3. Understanding the Complexity within the Ecosystem of Healthy

A systems map is a useful tool for developing a shared language that stakeholders can use to manage the complexity of an ecosystem. It helps stakeholders to understand the impact and consequences (intended and unintended) of intervening in the system and illustrates the interdependence of various actions. This section presents the systems map developed for the ecosystem of healthy and shows how this tool has been used to highlight the positive impact of maximizing healthy life years.

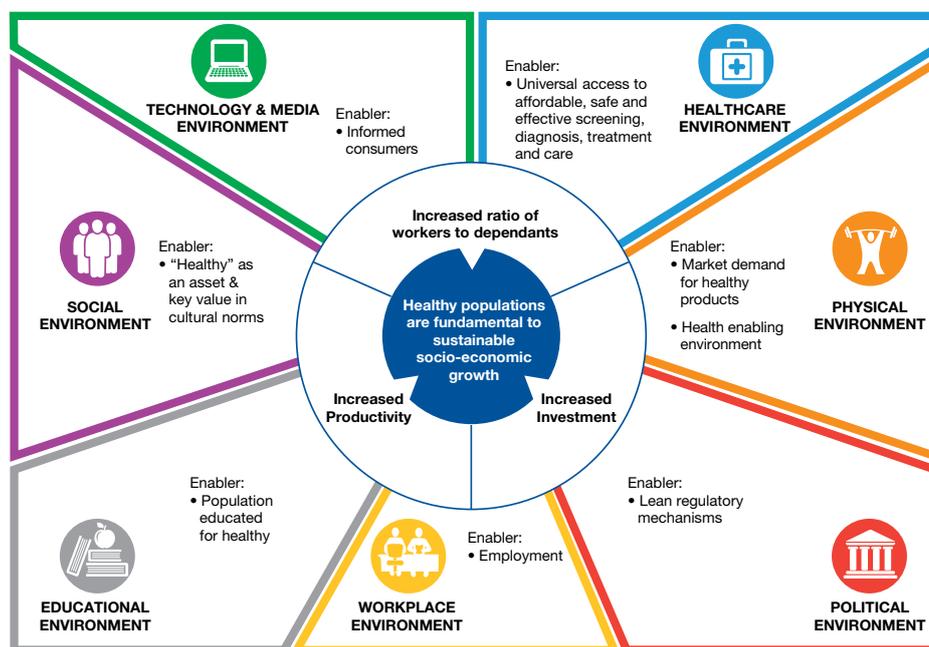
The systems map was designed during the course of several workshops with a variety of public sector, private sector, academic and civil society participants, as well as on the basis of individual expert consultations. (See the foldable full version of the systems map in the back-cover pocket of this report). Over 60 experts worked through the map considering two key perspectives:

1. NCDs and their key risk factors, given their global burden (Murray and Lopez, 1997; World Health Organization, 2014b)
2. The link between a healthy population and sustainable socio-economic growth

The systems map helped stakeholders in several ways: first, to visualize the many factors that influence the system; second, to see how various stakeholders across sectors can work together to have a greater impact on population health; and third, to identify, extract and prioritize the inflection points that have the greatest impact on population health and economic growth. For this purpose, inflection points were defined as critical points or phases in a person's life that can have an impact on overall health throughout the life cycle. The following building blocks were highlighted as critical for the systems map:

- **Central engine:** Anchors the key objective of the map, which is to position healthy populations as a catalyst for socio-economic growth
- **Seven thematic clusters:** Including physical environment, political environment, workplace environment, educational environment, technology and media environment, social environment and healthcare environment
- **Enablers:** Critical factors to enable healthy populations and stimulate socio-economic growth
- **Key variables:** Elements shaping each cluster that help to identify the inflection points that can be addressed by investment interventions

Figure 3: Systems Map: Healthy Populations Drive Economic Growth



Source: World Economic Forum, Bain

The development of the systems map revealed several important insights:

1. **All stakeholders will benefit from healthier populations** – ultimately, all stakeholders will draw socio-economic benefits from healthier populations.
2. **Determinants of health** – these cut across several thematic clusters and are essential to health as well as socio-economic outcomes.
3. **Traditional healthcare environment** – this is only a small part of the ecosystem of health. An inclusive ecosystem that enables healthy populations will re-direct resources from simply increasing total life expectancy through treatment and care to maximizing healthy life years via health promotion.
4. **Co-benefits** – a portfolio approach will support a discussion of the co-benefits of healthy populations that justify investments through multistakeholder engagement.
5. **Incentives** – setting the right incentives is critical to changing the system. Incentives can be set for individuals to adapt to a healthier lifestyle, but can also motivate organizations from the public and private sector to start investing in health.
6. **Impact** – given the complexity of the whole system, isolated or vertical actions are likely to have a limited impact. Only a portfolio approach, in which several stakeholders across sectors act in a concerted manner, will have the desired systemic impact.
7. **Inflection points** – several variables influence the dynamics within and across the thematic clusters. By analysing the systems map from an individual-based perspective across the entire life cycle, nine inflection points have been identified for which interventions are expected to have the highest impact and highest ROI. These inflection points are the basis for the ROI analysis in Section 4.
8. **Only through a systemic approach do public and private stakeholders get a holistic picture on the full societal costs and full societal benefits of healthy populations.**

The concept of maximizing healthy life years to assess the link between healthy populations and economic growth can provide a pragmatic approach to assessing the full range of costs and benefits societies face. By living healthier lives, communities nurture “**virtuous cycles of health**” – recurring cycles of events, with the result of each one increasing the beneficial effect of the next – that fuel both health and growth.

Some concrete examples may best illustrate the implications of this complexity and help explain the interwoven nature of these variables.

Designing for co-benefits: urbanization, physical activity and reinforcement of local economies

Designing urban environments in a way that promotes active transportation (e.g. walking and cycling) also provides a range of co-benefits, including increased levels of physical activity, which is critical for promoting and maintaining health; more social interaction; a larger number of people passing through urban areas, who are then more likely to buy from local stores, thereby strengthening local economies; reduced carbon emissions; and greater environmental protection. Therefore, when planning investment for urban settings or for retrofitting cities, the estimates on the returns generated by such an investment should consider not only the wide range of benefits generated for the health of the commuters, but also the benefits it would generate for the local economy and the environment (Bailey et al., 2013; World Health Organization, 2011; National Collaborating Centre for Environmental Health, 2010; Public Health Advisory Committee New Zealand, 2010).

New York City’s “pedestrianization” of Times Square, Herald Square and Union Square, where the city converted automobile lanes to pedestrian plazas with more walking space and seating, provides a good example of these benefits. In addition to reducing traffic injuries and encouraging more physical activity, the urban makeovers have generated economic benefits. In Union Square, there has been a 49% drop in vacant storefronts and, for the first time, Times Square has become one of the top 10 retail areas in the world. In a similar vein, the city’s FRESH (Food Retail Expansion to Support Health) programme has stimulated the building of grocery stores in parts of the city that were formerly food deserts, creating both new jobs and proximity to healthy food for residents (Mailman School of Public Health, 2014).



Another example comes from the “Ciclovía Recreativa” in the Americas. The Ciclovía Recreativa is the temporary closure of streets to motorized traffic (usually on Sundays or other specific days of the month), allowing the public to make use of the space to engage in physical activities such as running, walking, cycling and more. Policy-makers as well as city governments have found Ciclovías to be effective at promoting physical activity in their communities. The programme is currently being run in 38 cities in 11 countries across the Americas. The annual budgets range from nearly \$50,000 to \$2,000,000. A survey of existing Ciclovía programmes in the Americas showed that, in addition to significantly increasing the physical activity level of urbanites, 55% of the Ciclovías provide economic opportunities through temporary businesses. In Bogota, 96% of vendors that took advantage of the Ciclovía events were from the three lowest socio-economic strata and for one-third of them, the Ciclovía was their only source of employment. Of the programmes surveyed, 63% were observed to be engaging the community through volunteerism, providing students with a way to complete national service or giving retired citizens the opportunity to give back to the community (Sarmiento et al., 2007).

Designing with a focus on inflection points

The work with the systems map helped to strengthen knowledge about the key inflection points that must be tackled. The identification of these inflection points is critical for highlighting intervention opportunities that can be expected to have a significant impact on health outcomes, but will also generate a superior ROI. These investment opportunities fall along a continuum, ranging from interventions that yield individual-based benefits with an individual-based ROI (iROI) to those that generate a population-based ROI (pROI). If these interventions are set up correctly, they would create incentives for both individuals and organizations to make health a priority and start acting and investing.

The following section introduces the “virtuous cycle of health” and links it to the inflection point analysis and the findings of the systems map. Concrete investment examples demonstrate the ways various stakeholders have already been involved and the positive returns they have achieved on their investments in health.



4. Investments to Maximize Healthy Life Years Generate Superior Returns

The systems map provided a tool to understand the complexity of the full ecosystem and drives home the message that a holistic understanding of the eco-system is necessary to articulate the full range of costs and benefits associated with healthy populations. To translate such a complex systemic view into actionable points, an analysis was made following an individual-based approach across the whole life cycle. Key inflection points were identified based on the key interventions that are expected to have a high impact on health throughout the life cycle and to generate the highest ROI.

Figure 4 illustrates examples of key inflection points that influence the number of healthy life years that “Mary” or “Joe” are, on average able to enjoy. Each of these elements is able to significantly influence Mary’s health status and push her or Joe from an average health state to an unhealthy one, and vice versa. Depending on the outcome at a given inflection point, the individual may begin moving towards either a healthier or an unhealthier state – with critical socio-economic implications.

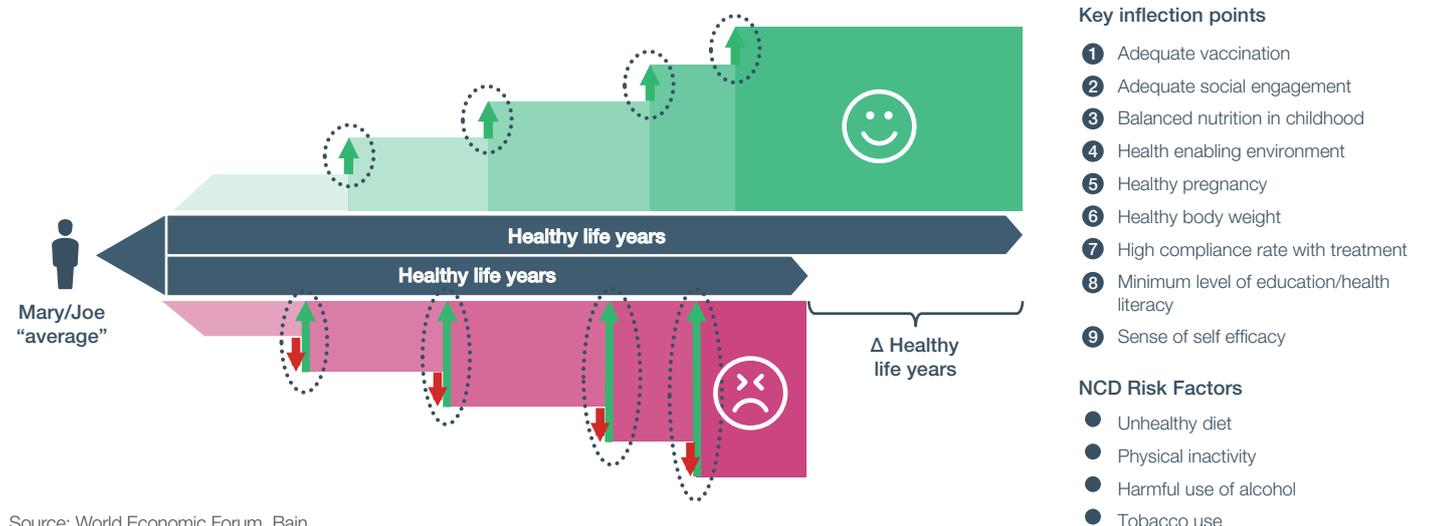
The key inflection points identified are either linked to a specific point in the lifespan (e.g. healthy pregnancy) or stretch over a longer period (e.g. maintaining a healthy body weight). These inflection points build on the need to address the key risk factors for mental health as well as the main risk factors for the other four main NCDs – unhealthy diet, harmful use of alcohol, tobacco use and lack of physical activity – and do not aim to exclude the influence of the broad determinants of health in overall health outcomes throughout the life cycle.

From the systems map and with the aim of translating it into actionable items, nine important inflection points were identified that have a significant impact on overall health throughout the life cycle. These are not exhaustive:

1. Adequate vaccination
2. Adequate social engagement
3. Balanced nutrition in childhood
4. Health-enabling environment
5. Healthy pregnancy
6. Healthy body weight
7. High compliance rate with treatment
8. Minimum level of education/health literacy
9. Sense of self-efficacy

Individuals can address these points with their own daily decisions or they may be influenced by boundaries set by the ecosystem of health in which they live. From an investment perspective, given that these are critical points at which the potential to influence the overall outcome seems higher, these may also be the areas in which the potential for health and socio-economic return may be more significant. Each inflection point can only be significantly influenced if multiple variables across thematic clusters of the systems map are aligned, reinforcing the critical message regarding the value of a multistakeholder approach for achieving the maximum impact.

Figure 4: Focus on Maximizing Healthy Life Years as a Key Goal



Source: World Economic Forum, Bain

The next section provides a series of data-driven examples and their health and economic outcomes to showcase opportunities for investment with positive returns. Figure 5 provides an overview of all the examples that appear in this report and how they link to the inflection points and the systems map.

From a systemic view to actionable items

The methodology applied for most of the examples presented in next section involved putting a monetary value (e.g. GDP/capita) on each additional healthy life year gained (i.e. averted DALY) as a result of the intervention. Nevertheless, the underlying data availability, assumptions and circumstances vary between the examples. Therefore, the results presented cannot and should not be directly compared with each other.

The purpose of providing these examples was not to rank or compare ROI across specific interventions, but to support the general argument that investments in a healthy population generate positive returns for both businesses and governments.

Six examples with positive ROI are described and their links to the systems map and the inflection points targeted throughout the life cycle have been highlighted:

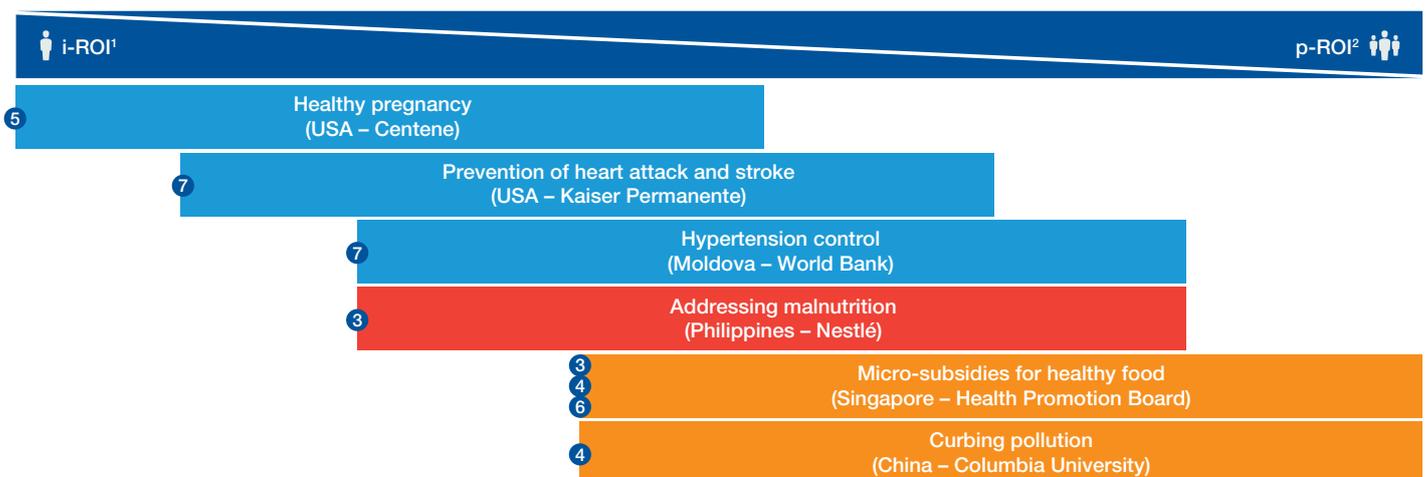
- **Healthy pregnancy – Centene:** inflection point 5; linking healthcare, social and educational environments
- **Prevention of cardiovascular diseases – Kaiser Permanente:** inflection point 7; linking healthcare and political environments
- **Hypertension control – World Bank:** inflection point 7; linking healthcare and political environments
- **Addressing malnutrition – Nestlé:** inflection point 3; linking physical, political and educational environments

- **Micro-subsidies for healthier food – Health Promotion Board of Singapore:** inflection points 3, 4, 6; linking political and physical environments
- **Curbing pollution – Mailman School of Public Health, Columbia University:** inflection point 4; linking physical and political environments

Individual-based interventions are activities that target the individual directly and promote behavioural change or support the individual in a certain phase of life. For example, targeting women during pregnancy to help them access the best care possible and to empower them to stay healthy throughout the gestational period is critical not only for their post-pregnancy health, but also for the health of their babies. Linking the healthcare, social and educational environments, Figure 6 presents Centene’s Start Smart for Your Baby®, a programme that helps women to have a healthier pregnancy. With its individual case management and wellness and disease management, this programme has led to a 4.5% reduction in extremely low birth weight deliveries.

The programme has the potential to start mothers and newborns off on a healthier life path. With an average programme cost of \$75 per participating mother and benefits of \$500, leading to an iROI of 300% to 500%.

Figure 5: Examples that Showcase Opportunities for Investment with Positive Returns

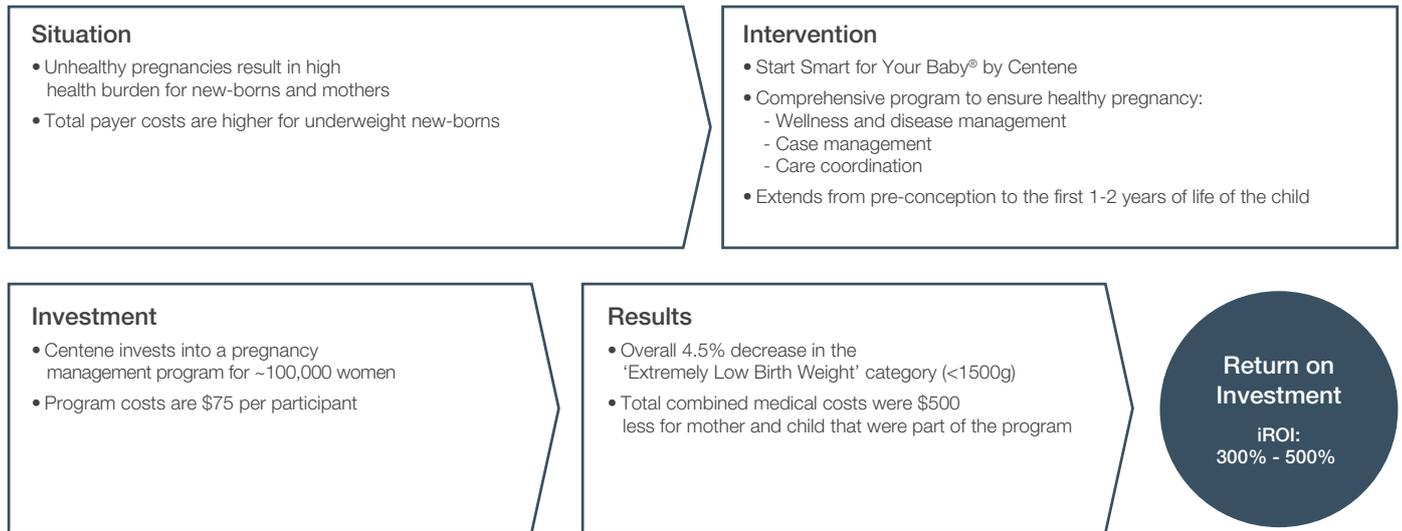


Thematic clusters of the systems map:

- Healthcare environment
- Physical environment
- Political environment
- Workplace environment
- Educational environment
- Social environment
- Technology & media environment
- Inflection points addressed

¹ Individual Return on Investment; ² Population Return on Investment
Source: World Economic Forum, Bain

Figure 6: Healthy Pregnancy



Note: iROI = Individual ROI
Source: Centene Corporation

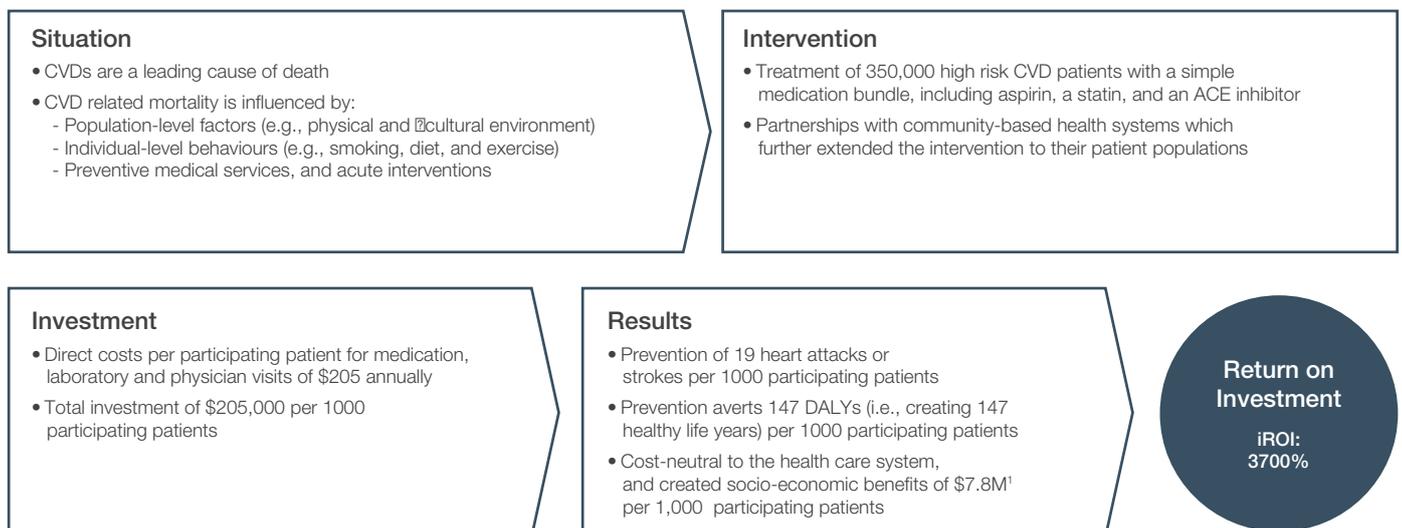
Cardiovascular diseases, including heart attack and stroke, are the leading cause of death worldwide. The related mortality rate is influenced by many factors, including population-level factors (e.g. physical and cultural environment), individual-level behaviour (e.g. smoking, diet and exercise) and acute interventions when cardiovascular events occur. Kaiser Permanente set up a programme to treat 350,000 high-risk patients with a simple medication bundle, including aspirin, a statin, and an ACE inhibitor. In addition, partnerships with community-based health systems helped to further extend the programme to their patient populations.

The programme has a direct cost of \$205 per year for each participating high-risk patient, which translates into a total investment of \$205,000 per 1,000 participating patients. The programme prevents 19 heart attacks or strokes per 1,000 participating patients per year, which results in 147 fewer unhealthy years per 1,000 high-risk patients. Those additional healthy life years have a socio-economic value of \$7.8 million, giving an iROI of 3700%.

As net healthcare savings are dependent on the efficiency and cost structure of the healthcare delivery system, savings in healthcare costs are not included in the ROI, which would be even higher if cost avoidance were included. Cardiovascular events could be cut by a further half if all eligible patients took the recommended medications, quit smoking, exercised and lost weight, and 45% of the remaining benefit would stem from healthier behaviour.



Figure 7: Prevention of Heart Attack and Stroke



¹ Assuming economic benefit of \$53,143 (PPP) per DALY, Based only on socio-economic benefits, not including avoided healthcare costs
Note: iROI = Individual ROI
Source: Kaiser Permanente

Figure 8 illustrates a theoretic intervention by the Government of Moldova and the World Bank to control hypertension. This intervention highlights the links between the healthcare and political clusters of the systems map. By providing a financial protection scheme to increase hypertension control in adults, the intervention aims to increase reimbursement rates of generic antihypertensive drugs from 50% to 70%. The intervention is estimated to avert 18,300 DALYs in the first investment period (2014-2020) and 100,800 in the longer period (2014-2030). The investment case is calculated for two time frames and the pROI of the longer time period (290%) is significantly higher than the shorter time period (40%), demonstrating that long-term investments in healthy populations result in an even larger economic pay-off.



Figure 8: Hypertension Control



Situation

- Hypertension is second leading health risk factor in Moldova, contributes to high rates of strokes (8.4% of total DALYs) and ischemic heart disease (17.9% of total DALYs)
- Fewer than one in three patients with hypertension taking medication daily

Intervention

- Support for a financial protection scheme to increase hypertension control in adults
- Goal to increase reimbursement of antihypertensive drugs from 50% to 70%

Investment

- World Bank to invest together with the Government of Moldova
- Present value of combined investment totals \$34M for 2014-2020 and \$73M for 2014-2030 period

Results

- Intervention expected to avert 18,300 DALYs for 2014-2020 and 100,800 DALYs for 2014-2030 period respectively¹
- Expected NPV from economic benefits totals \$13M and \$210M respectively²

Return on Investment

pROI (2014-2020): 40%

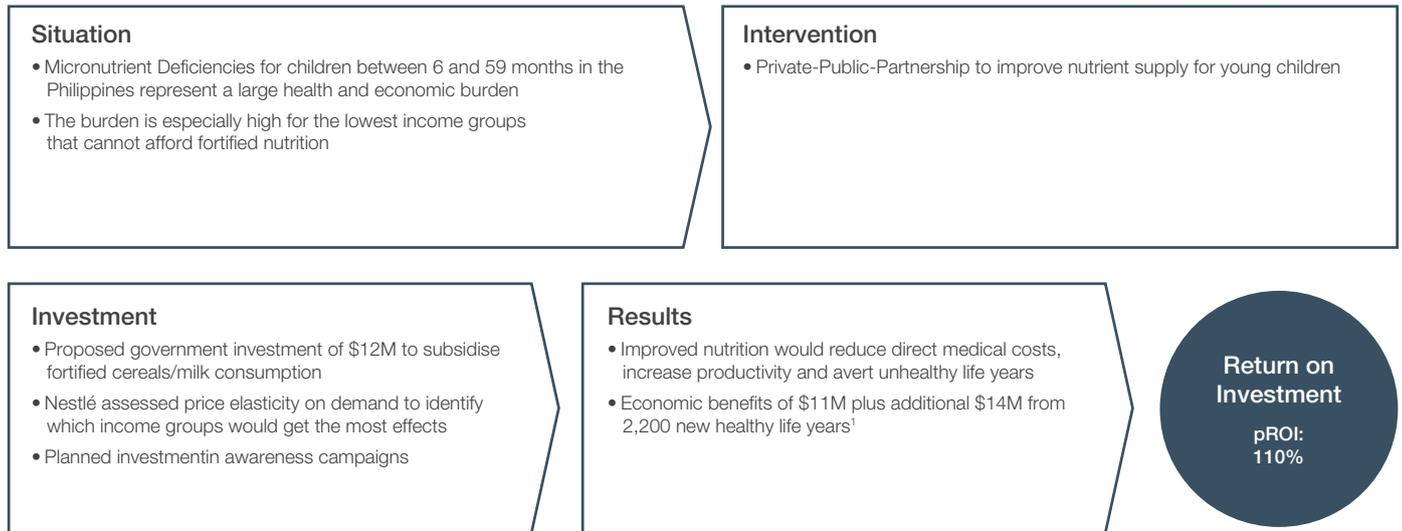
pROI (2014-2030): 290%

¹ Based on the 2010 Global Burden of Disease Study led by IHME; ² Estimate based on one per capita income of \$5'935 adj. by an annual real growth rate of 4%
 Note: Theoretical cases by building on active lending operations of the World Bank in Moldova; pROI = Population ROI
 Source: World Bank

Public investments are not the only type of investment that can create superior returns for society. Private or private-public partnerships can yield high returns, too. Figure 9, which highlights the links between the physical, political and educational clusters of the systems map, describes the potential for private-public collaborations. Nestlé's investment in a better understanding of the causes and effects of malnutrition in the Philippines, together with subsidies from the Philippine government, is expected to result in improved population health. This market-driven initiative based on an existing commercial product improved physical and cognitive development of Philippine children and would have a strong economic impact. In addition to a gain of \$11 million from reduced direct medical costs and increased productivity, there could be a further added benefit of \$14 million resulting from 2,200 more healthy life years. This would equate to a pROI of 110%.



Figure 9: Addressing Malnutrition



¹ Assumed value/DALY equals 1 times GDP/capita with \$6'533 (PPP) for the Philippines in 2013;
 Note: Example calculated for poorest 20% socio-economic strata with a 20% assumed discount; pROI = Population ROI
 Source: Nestlé

Figure 10 presents the population-based intervention developed by Singapore's Health Promotion Board of government-funded subsidies. Linking the political and physical clusters of the systems map, it shows the expected effects on population health of healthy food subsidies for meals outside the home. The programme is estimated to replace 1,860 DALYs with healthy life years. This could result in a tremendous economic return for Singapore of 102 million Singapore dollars in 2020. The high pROI of more than 1100% is especially impressive given the fact that some benefits, such as reduced healthcare costs, were not included in the analysis, resulting in a more conservative estimate.



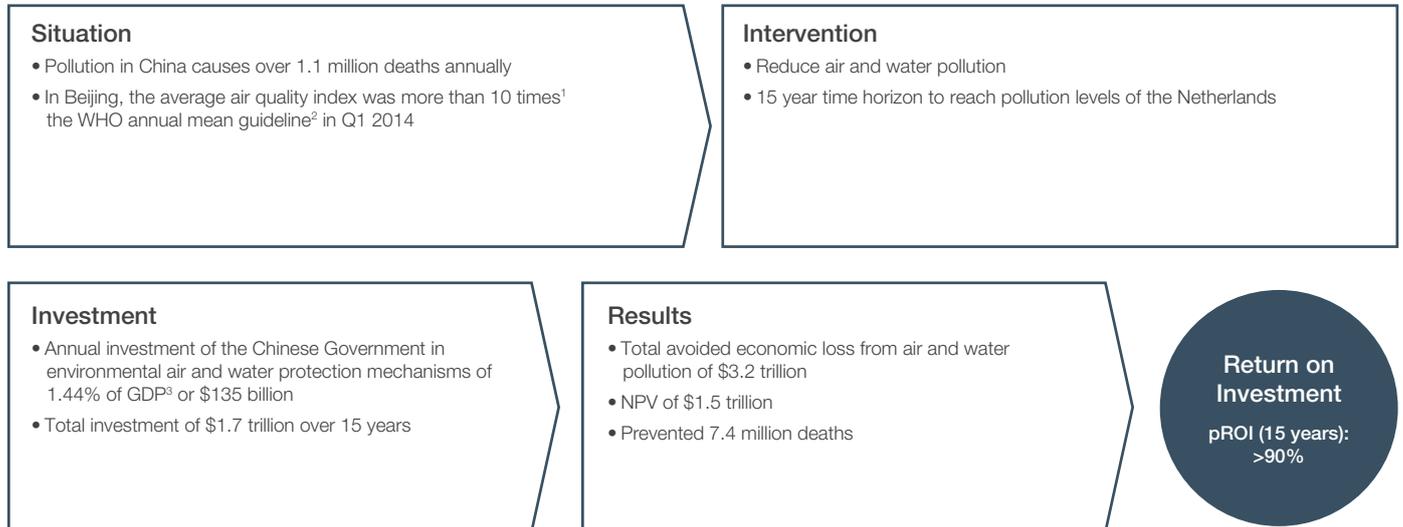
Figure 10: Micro-Subsidies for Healthier Food



¹ Assumed subsidy of S\$0.045 per meal ² Assumed value/DALY equals annual gross median income with SGD 54'684 for Singapore in 2020
 Note: Example to build up the logic model for HPB's strategy development in obesity control from 2014 to 2020; pROI = Population ROI
 Source: Health Promotion Board of Singapore

Pollution in China causes over 1.1 million deaths annually. A theoretical intervention developed by Columbia University (see Figure 11) links the physical and political environments of the systems map. It assumes an investment of 1.44% of GDP in air and water protection. These environmental protection mechanisms are expected to generate net benefits of \$1.5 trillion over a 15-year period, giving a pROI of over 90%.

Figure 11: Curbing Pollution



¹“Mission China Air Quality Monitoring Program.” edited by U.S. Department of State: State Air, 2014.;

²“Ambient (Outdoor) Air Quality and Health.” World Health Organization.;

³Investment equivalent to the Netherlands

Note: Example built on assumed 15 years investment applying investment conditions from the Netherlands; pROI = Population ROI

Source: Columbia University

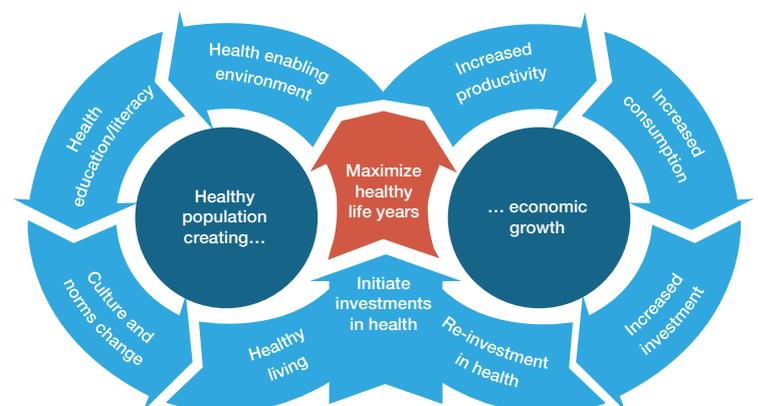
The examples shared demonstrate some important findings about successful investments in health:

Both public and private stakeholders can realize a return from investing towards healthier populations.

- All **seven thematic clusters** of the health ecosystem **offer opportunities for investments** with a high potential for returns for both individuals and populations.
- Finding the **right areas** and stakeholders to invest **will maximize healthy life years** and thereby increase the opportunities for economic growth.
- Planning in terms of **key inflection points** will help to **find the intervention areas with a high potential impact and return** for the various stakeholders that need to be engaged.
- It is also important to highlight that while the inflection points equally apply to all socio-economic levels in populations, the inflection “angle” may have a different width for the lowest socio-economic levels, with a different consequent effect on the ROI.
- All interventions generate **tangible and non-tangible benefits**. Even if only the quantifiable tangible benefits are considered, many interventions show to be positive investments on that basis alone.

The proposition that healthy populations stimulate economic growth can best be demonstrated by reviewing the driving forces of both healthy populations and economic growth. The “**virtuous cycles of health**” presented in Figure 12 shows that these are two interwoven cycles. The central engine of both cycles is the notion of maximizing healthy life years, which fuels both health and socio-economic outcomes.

Figure 12: A Virtuous Cycle: Healthy Life Years as a Source for Continuous Economic Growth



Source: World Economic Forum, Bain

5. Rethinking the ROI for a Healthy Population

The systemic view captured through the systems map and the illustrative examples in Section 4, put forward the proposition that investments in healthy populations can generate favourable returns, particularly if the full range of costs and full range of benefits to businesses, governments and societies at large are well understood and articulated.

Why are there nonetheless very few investments in health promotion and enabling healthier populations compared with investments in the traditional healthcare sector? For example, 2010 expenditure on organized public health and prevention programmes in the EU24 remained at a very low 2.9% of total expenditure on health (OECD, 2012).

Several challenges should be considered in rethinking the ROI. Taking these into consideration will foster alignment between public and private stakeholders which is critical to move forward an agenda for investing in healthier populations.

Challenge one: the potential disconnect between investors and beneficiaries. Who pays and for whose benefit? Depending on who is making the initial investment (e.g. government) or who is incurring the main costs (e.g. private sector or individuals through out of pocket expenses), this potential disconnect might deter investments in healthy populations, particularly when the investor and beneficiary might not be the same or when one benefits more than the other. As highlighted in with the systems map, ultimately all stakeholders will draw socio-economic benefits from healthier populations. However, when not all parties see clearly their full range of benefits and only have insight into what a particular intervention will cost them, there is potential for a disconnect that can deter investment. Thus, identifying externalities and mechanisms to align investors and beneficiaries will not only invite investment in the ecosystem of health, but will also help highlight the paths through which each stakeholder can yield direct and indirect returns. Highlighting the qualitative benefits of healthier populations can help to overcome this disconnect and stimulate investment.

The quantitative and qualitative benefits that can emerge from investing in health are illustrated in Figure 13. Although only the quantitative benefits are considered in most ROI assessments, the fact that there are non-tangible benefits to be gained as well provides further reason for private as well as public stakeholders to invest. This highlights the need for conceptualizing a societal ROI that increasingly incorporates the benefits to the whole system stemming from healthier families, communities and societies.

It is critical that all parties involved assess the full benefits of the intervention in a concerted manner. Only a complete assessment will reveal the benefits that are relevant to all stakeholders and might help generate a positive ROI for all parties involved. If different agendas or conflicting interests deter investments that would be beneficial for society as a whole, stakeholders may need to identify incentives or population level externalities that can unlock the investment pool and foster the implementation of sustainable business models.

Challenge two: the role of the different stakeholders. Enabling healthier populations is traditionally seen as a public sector role. However, as the systems map and the case examples show, this view is too limited and neglects other important relationships and stakeholders, such as the private sector. Various stakeholders from a variety of different sectors are needed to enable effective interventions and develop investment opportunities, and goals need to be aligned. The private sector, public sector and civil society are all critical stakeholders for a holistic and systemic impact and should be able to operate with a shared agenda of maximizing healthy life years.

Figure 13: Tangible and Intangible Benefits of a Healthy Population

NOT EXHAUSTIVE

	Private Sector	Public Sector / Civil Society
Tangible	<ul style="list-style-type: none"> - Increased productivity of employees - Increased disposable income from healthier consumers - Increased demand for products and services - Reduced sick days of employees - Reduced healthcare costs for employers/payers 	<ul style="list-style-type: none"> - Increased tax revenues - Reduced healthcare costs - Potential job creation within the eco-system of healthy - Investments in healthy products/ services/ infrastructure fuels economy
Intangible	<ul style="list-style-type: none"> - Improved brand trust - Improved customer and employee loyalty - Other first-mover advantages 	<ul style="list-style-type: none"> - Competitive advantage and potential to attract talent and entrepreneurship to healthier cities and communities - Demographic dividend - Compound effect of healthy behaviours across generations - Political will, Political capital, Social support

Source: World Economic Forum, Bain

Challenge three: a lack of understanding about the various investment opportunities. To generate momentum, it is important to attract public and private sector investment. To do that, the positive returns that a healthy population can generate to businesses, governments and societies at large should be highlighted. A holistic ROI framework that takes the full range of costs and benefits into account (and articulates who incurs both such costs and benefits) will make it easier for the private sector to find positive opportunities to invest in health and thereby help shape consumer and individual demand for health-promoting services and products.

Challenge four: inbuilt disincentives in the traditional healthcare setting. In many countries, healthcare systems are set up to reward services rather than outcomes. This results in scarce or no incentives for promoting health and for ensuring individuals are as healthy as possible. Rewiring healthcare systems to reward healthcare professionals and individuals will incentivize positive health behaviours and accelerate progress along the path to healthier societies.

Challenge five: overcoming the gap between efficacy and effectiveness of interventions, i.e. what works under ideal conditions and what works under real and domain specific conditions. There are real challenges in many settings, all the more so if the information asymmetry is bigger between the providers and users of services. Investors, public or private alike will need to carefully plan and continuously monitor and evaluate the implementation of interventions as even for those with proven effectiveness there are multiple factors which may influence their efficacy and therefore their impact (and ROI).

The time to invest in health is now and the world needs to think and act in a new way when it comes to the ROI for healthy populations. The overall societal and economic returns are undeniable. Creating a broader understanding about the full range of costs incurred through unhealthy populations, the multiple investment opportunities available and full range of returns to businesses, governments and societies will help to fuel the virtuous cycle of health by maximizing healthy life years. Getting all relevant stakeholders on board to gain greater traction for health investment and the implementation of innovative business models must be a top priority for everyone involved.



6. Conclusions and Outlook

Healthy populations are a key driver of socio-economic growth and despite the fact that few will dispute this, collective actions do not always reflect the importance and priority that should be allocated to investing in healthier individuals and societies.

The ecosystem of health is complex, but also full of opportunities and inflection points to bring populations to healthier states with the respective socio-economic gains that this will deliver. A new level of debate is needed, followed by concrete action to kick-start the virtuous cycle of health. This cycle will unlock investments that link both healthy populations and economic prosperity and will help to generate further investment.

All stakeholders can benefit from investing in maximizing healthy life years and can help move the current landscape from “healthy as a cost” to “healthy as an investment”, particularly when it comes to investing in the prevention of the largest killers of the decade: NCDs. Taking a holistic and systemic approach in which all public and private stakeholders understand the full range of costs and benefits that can be incurred to their business, public policies and societies will lead to a step-change in the health investment agenda.

This effort will require multistakeholder engagement and most importantly multistakeholder action. Since the returns of many health interventions are beneficial for different parties, a collaborative approach is important to realize the potential for aggregated and societal gains and to unlock the necessary investment.

Healthy populations provide the competitive advantage that today’s economies need in times of slow economic growth and increased competition. The future winners of this competitive environment will be those that grasp these business opportunities and invest. There is no question that this is the right way forward.

The focus of the second year of the World Economic Forum’s “Future of Healthy” project will be on identifying these attractive investment opportunities and business models, and on providing a platform for public and private stakeholders to explore synergies for various investments in healthy populations. The project will also seek to promote opportunities for moving society towards a healthier ecosystem where all relevant stakeholders are engaged in a solution-seeking journey that will result in positive health and socio-economic outcomes.



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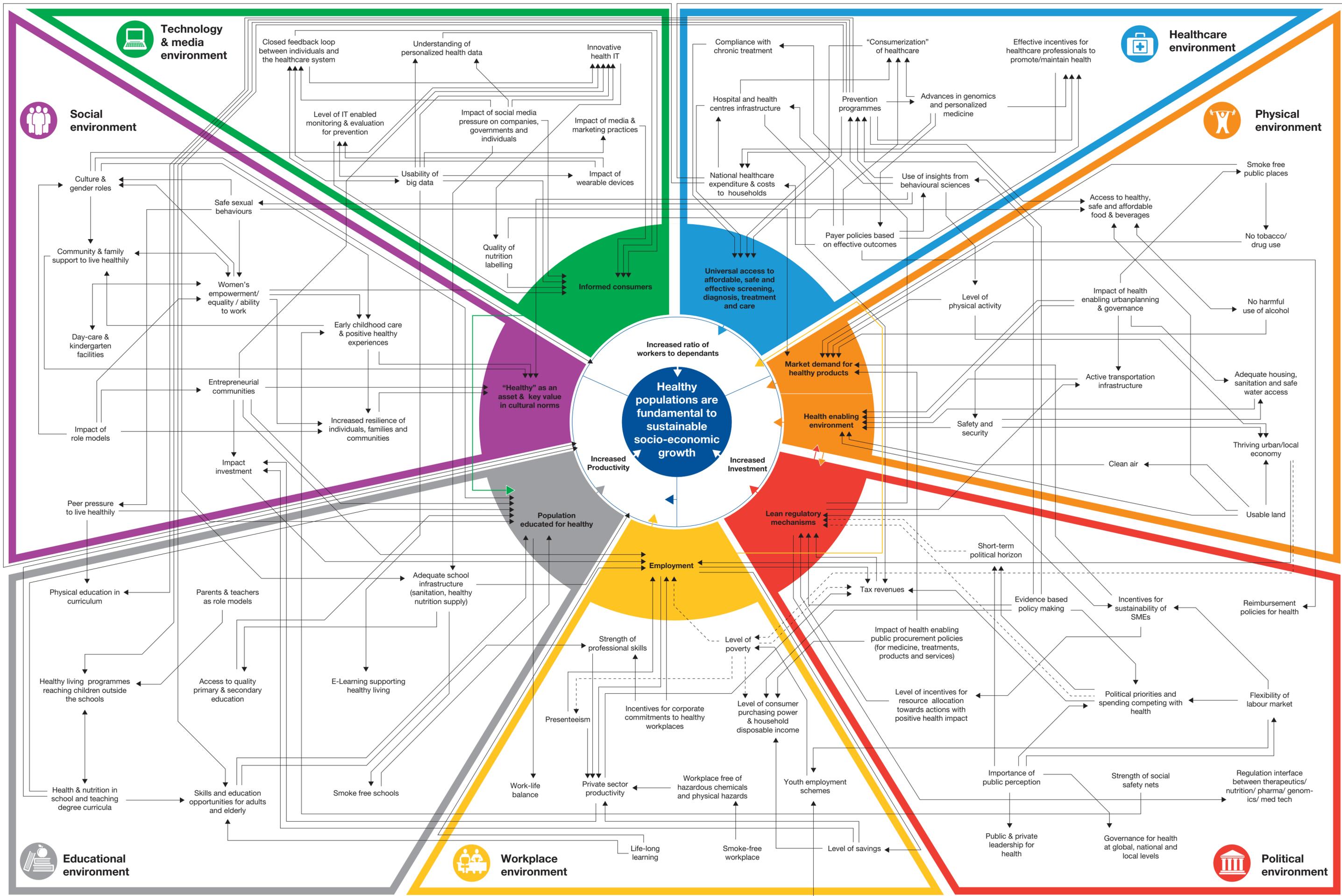
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