

### Population-wide versus Individual-based Approach

- 2.14 The distribution of health determinants and risks in a population has implications for successful prevention strategies. While a population-wide strategy for prevention targets at controlling the determinants of health in the population as a whole, an individual-based (also known as high-risk) strategy for prevention identifies high-risk susceptible individuals and offers them some individual protection.<sup>15</sup>
- 2.15 The two approaches have their inherent pros and cons (Exhibit 11). The population-wide approach seeks to promote healthy behaviour to achieve an overall lowering of the risk in the entire population. The potential gains are comparatively extensive but the effect on each participating individual may not be very significant. In contrast, the individual-based approach may appear more appropriate to the individuals. However, it only has a limited effect at a population level and it does not alter the underlying causes of illness. Such an approach also requires continuous and expensive screening processes to identify the high-risk individuals.<sup>16</sup>

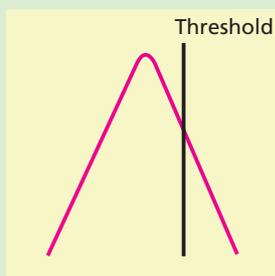
**Exhibit 11: Population-wide approach versus individual-based approach**

	Population-wide approach	Individual-based approach
Benefit is high for	The whole population	The individual
Subject motivation	Low	High
Doctor motivation	Low	High
Benefit-risk ratio	Worrisome	Favourable
Screening costs	No/Low screening costs	High
Depth of solution	Radical	Palliative, temporary

(Source: Rose 1985)

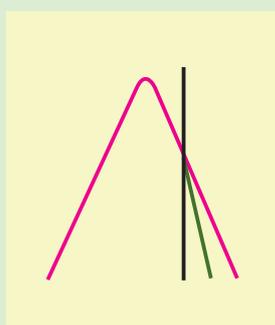
- 2.16 Cardiac rehabilitation programme, which is an example of individual-based approach for prevention, is known to be effective in reducing cardiac deaths. Patients are encouraged to exercise and change their lifestyles after having a heart attack or other heart problems and they can be benefited from tailored lifestyle programmes. A systematic review reported that total cardiac mortality was reduced by 26% to 31% in the exercise only and comprehensive cardiac rehabilitation groups.<sup>14</sup> Another study showed that lifestyle intervention using such approach reduced the risk of people with impaired glucose tolerance in developing diabetes mellitus by 58% over 6 years.<sup>17</sup>
- 2.17 With regard to effective interventions using population-wide approach, raising the duties on tobacco products has resulted in a large improvement in population health because fewer people smoke as the price of tobacco rises. Reducing the salt content of processed foods available for sale in the markets, either through legislation or self-regulation of the industry, has resulted in a corresponding reduction in age-specific and sex-specific mean systolic blood pressure.<sup>18,19</sup>
- 2.18 When NCD are prevalent in the community, even modest changes in risk factor levels through population-wide approach will yield significant public health benefit. In light of the inherent benefit of individual-based approach for people at high risk, it should also be included in the overall prevention and control of NCD (Exhibit 12).<sup>17</sup> A key challenge is to achieve a balance between individual-based and population-wide approaches.

### Exhibit 12: Population-wide and individual-based strategies



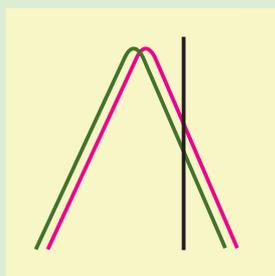
#### ***Original distribution***

The level of risk factors is normally distributed within the population as illustrated by the red curve — It means that majority of people have risk factor level below the threshold, while minority are above the threshold.



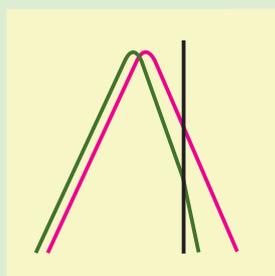
#### ***Individual-based approach***

This approach concentrates its efforts on the high-risk individuals with risk factor level above a certain threshold. When preventive measures are targeted at these identified people at high-risk, the distribution of risk factor level can only shift a little to the low level direction as indicated by the green curve.



#### ***Population-wide approach***

This strategy seeks to shift the whole distribution of risk factor level to the low level. The whole distribution of risk factor level, as indicated by the shifted green curve towards left to lower values.



#### ***Combined strategies***

Therefore, combining individual-based and population-wide approach will shift the distribution of risk factor level to a lower range that yield better health outcome among the whole population.

(Source: Rose 1985)

- 2.19 There are many examples worldwide on successful mix of population-wide approach and individual-based approach for preventing and controlling NCD (Exhibit 13).

### Exhibit 13: Successful mix of population-wide and individual-based NCD prevention programmes

Communities can make major gains once becoming involved in reducing health risk behaviours associated with many chronic diseases. Some of the most notable cardiovascular diseases prevention trials are the Stanford Three-Community Project,<sup>20</sup> North Karelia Project,<sup>21</sup> Stanford Five-City Project,<sup>22</sup> Minnesota Heart Health Program<sup>23</sup> and the Pawtucket Heart Health Program.<sup>24</sup> These projects have made known that cardiovascular diseases are preventable through modifications of established risk factors including cigarette smoking, elevated blood lipids, elevated blood pressure and sedentary lifestyle.

The basic premise for this work is that community-wide strategies lead to a reduction in disease rates through changes in individual and community risk factors. Each provides valuable models, diversified methodologies addressing awareness and education, skill-building and advocacy, and strategies for planning and implementing community-based/led programmes. These programmes are cost-effective, easily transferable and have dramatic impacts on health policy development.<sup>25</sup>

## Health Disparity

- 2.20 Disparity in health usually refers to a broad range of differences in health status between population subgroups. Although some disparities in health are inevitable because of genetic and biological make-up in individuals, health disparities are often attributed to differences in personal lifestyle, exposure to material resources and opportunity of receiving healthcare services.<sup>26</sup> For example in China, as the result of increasing affluence and the adoption of western diet, people living in the cities had a 2.7-fold increase risk of having diabetes mellitus than those living in poor rural area (Exhibit 14).<sup>27</sup>
- 2.21 Striving to minimise the health gap between population subgroups has become a challenge in public health.<sup>2</sup> Thus, an important public health task is to identify the underlying health determinants attributable to health disparities and develop responsive policies for their reduction.