Technical briefing for Appendix 3 of the Global Action Plan for Non-Communicable Diseases

Tobacco control interventions

List of interventions

<table>
<thead>
<tr>
<th>Number</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Increase excise taxes and prices on tobacco products</td>
</tr>
<tr>
<td>T2</td>
<td>Implement large graphic health warnings on all tobacco packages, accompanied by plain/standardized packaging.</td>
</tr>
<tr>
<td>T3</td>
<td>Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship</td>
</tr>
<tr>
<td>T4</td>
<td>Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport</td>
</tr>
<tr>
<td>T5</td>
<td>Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second hand smoke, and encourage behavior change</td>
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<tr>
<td>T6</td>
<td>Provision of cost-covered effective population-wide support (including brief advice, national toll-free quit line services and mCessation) for tobacco cessation to all tobacco users</td>
</tr>
<tr>
<td>T7</td>
<td>Provision of cost-covered effective pharmacological interventions to all tobacco users who want to quit, through the use of nicotine replacement therapy (NRT), Bupropion and Varenicline.</td>
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</table>

Identification of interventions

The interventions considered are primarily based on the MPOWER technical package of demand reduction measures developed by WHO [1], in line with the WHO Framework Convention on Tobacco Control (WHO FCTC) [2]. The MPOWER measures are:

- Monitor tobacco use and prevention policies
- Protect people from tobacco smoke
- Offer help to quit tobacco use
- Warn about the dangers of tobacco
- Enforce bans on tobacco advertising, promotion and sponsorship
- Raise taxes on tobacco

For the 2022 update, the interventions remained largely the same as the 2017 analysis, except for the interventions relating to tobacco cessation (T6 and T7). For T6, mCessation was included among the
population-wide interventions, while a new intervention capturing pharmacological interventions for tobacco cessation has been added as T7.

Interventions included are those with the strongest evidence on effectiveness. While it is recognised that the use of electronic nicotine delivery systems and other novel and emerging tobacco and nicotine products is not without harm and that weak regulation of these products can potentially undermine tobacco control policies, current evidence on the full impact of novel and emerging tobacco and nicotine products on NCD burden is still emerging. WHO will monitor the evidence for future updates of Appendix 3.

Methodological assumptions

- The epidemiological impact of the interventions was estimated using the OneHealth Tool [3].
- The methodology follows the 2017 appendix 3 update [4], and previously published modelling on tobacco control costing [5] and impact [6].
- Tobacco use prevalence data was taken from WHO’s Global Health Observatory country-specific data on tobacco use prevalence adults aged 15 and above [7].
- Epidemiology data on prevalence, incidence and mortality for Coronary Heart Disease, Stroke, Type 2 Diabetes, Hypertension, Colorectal and Breast Cancers were obtained from the Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease (GBD) 2019 study at the country-level [8].
- Disability weights for each health condition were drawn from the IHME GBD 2019 disability weight study. This information was used to estimate Healthy-Life Years (HLY) gained by each intervention [8].
- The baseline scenario was modelled after the current implementation status of MPOWER measures taken from the WHO Report on the Global Tobacco Epidemic 2021 [9].
- Similar to the 2017 update, reductions in tobacco use prevalence were modelled to impact either disease incidence directly, or for vascular diseases via the risk prediction equation [10], following appropriate lag times.
- Tobacco use is associated with incidence of major noncommunicable diseases, and was modelled using the relative risk figures in the following table:

Table 1: Relative risks of major noncommunicable diseases associated with tobacco use

<table>
<thead>
<tr>
<th>Disease</th>
<th>Relative Risk (RR) Males</th>
<th>Relative Risk (RR) Females</th>
</tr>
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<tbody>
<tr>
<td>Ischemic Heart Disease [11]</td>
<td>1.44 – 5.51*</td>
<td>1.68 – 3.78*</td>
</tr>
<tr>
<td>Cervical Cancer [10]</td>
<td></td>
<td>1.50</td>
</tr>
</tbody>
</table>
Asthma [10] | 1.90 | 2.00  
Chronic obstructive pulmonary disease (COPD) [10] | 10.80 | 12.30  
Type 2 Diabetes Mellitus [12] | 1.44 | 1.44  
Lung Cancer* | 21.30 | 12.50  

* Values are age-dependent  
*Impact from Lung Cancer and other cancers attributable to tobacco use were not included

- This analysis is limited by the modelling platform used to estimate impact, which does not include a significant portion of the attributable mortality and morbidity burden to tobacco use. This creates an under-calculation of the health impact associated with tobacco control interventions. The resulting cost-effectiveness ratios are thus a significant underestimation, with real health impact likely to be much higher.

**Table 2: Modelling assumptions used in WHO-CHOOSE analysis**

<table>
<thead>
<tr>
<th>Population (P), effect size of interventions (E) and outcomes (O)</th>
<th>Comments on evidence and main changes to 2017 analysis</th>
</tr>
</thead>
</table>
| **T1** | **P**: Policy/legislative intervention covering the entire population  
**E**: Increase excise taxes and prices on tobacco products. Assumes an excise tax increase that causes retail prices to increase by 25%. For low- and middle-income countries, elasticity values cluster around -0.5 [13].  
**O**: Healthy Life Years (HLY) gained, and mortality averted. | The baseline tax rates and other data have been updated based on data from the 2021 WHO Report on the Global Tobacco Epidemic. |
| **T2** | **P**: Policy/legislative intervention covering the entire population  
**E**: Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages. Tobacco use prevalence is reduced by 5% if implemented at the highest intensity level [14].  
**O**: Healthy Life Years (HLY) gained, and mortality averted. | Increased from the effect size used in 2017 (4%) due to updates in the reference study |
| **T3** | **P**: Policy/legislative intervention covering the entire population  
**E**: Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship. Tobacco use prevalence is reduced by 3% if implemented at the highest intensity level [14]. | Decreased from the effect size used in 2017 (10%) due to updates in the reference study |
| T4 | **P:** Policy/legislative intervention covering the entire population  
**E:** Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places, public transport. Tobacco use prevalence is reduced by 7% if implemented at the highest intensity level [14].  
**O:** Healthy Life Years (HLY) gained, and mortality averted. | Increased from the effect size used in 2017 (4%) due to updates in the reference study |
|---|---|---|
| T5 | **P:** Policy/legislative intervention covering the entire population  
**E:** Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second hand smoke. Tobacco use prevalence is reduced by 6% if implemented at the highest intensity level [14].  
**O:** Healthy Life Years (HLY) gained, and mortality averted. | Increased from the effect size used in 2017 (3.25%) due to updates in the reference study |
| T6 | **P:** All tobacco users  
**E:** Provision of cost-covered effective population-wide support (including brief advice, national toll-free quit line services and mCessation) for tobacco cessation to all tobacco users. Tobacco use prevalence is reduced by 2% to 5% if implemented at the highest intensity level [15].  
**O:** Healthy Life Years (HLY) gained, and mortality averted. | mCessation was added among the intervention components. It is defined as cessation support provided using one- or two-way messaging through SMS or other channels.  
The following effect sizes were used for each component:  
- Brief advice: 2%  
- Quitline: 5%  
- mCessation: 4% |
| T7 | **P:** All tobacco users who want to quit  
**E:** Provision of cost-covered effective pharmacological interventions to all tobacco users who want to quit. This includes Nicotine replacement therapy (NRT), Bupropion, and Varenicline. Tobacco use prevalence is reduced by 6% to 15% if implemented at the highest intensity level [15].  
**O:** Healthy Life Years (HLY) gained, and mortality averted. | Added Bupropion and Varenicline which have both been included in the WHO Essential Medicines List  
The following effect sizes were used for each pharmacotherapy:  
- NRT: 6%  
- Bupropion: 7%  
- Varenicline: 15% |
Table 3: Costing assumptions used in WHO-CHOICE analysis

<table>
<thead>
<tr>
<th>Major costing assumptions</th>
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<tbody>
<tr>
<td><strong>T1</strong> - T5</td>
</tr>
<tr>
<td>• These interventions are considered as legislative or policy interventions. Assumptions on human resource requirements have been previously published in detail [5].</td>
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<tr>
<td><strong>T6</strong></td>
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<tr>
<td>• The methods and assumptions for costing follow those used in the global investment case for tobacco cessation. For more details please see the reference document [16].</td>
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<tr>
<td>• Brief advice: The costing approach for this intervention follows a published reimbursement scheme for cessation [17] and compared with the average cost of an outpatient visit. Based on this, the fee for brief advice was estimated at 24% of the cost of an average outpatient visit, which was then applied to all countries included in the analysis.</td>
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<tr>
<td>• National toll-free quitline: Call cost assumes 40 minutes per tobacco user reached, broken down as two calls per smoker (30-min initial and 10-min follow-up). The unit price was derived [18] in combination with information on costs associated with toll-free -800 call services. Quitline counsellors were assumed to take 5,280 calls per year in an 8-hour/day shift five days per week.</td>
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<td>• mCessation: Participants receive five text messages per day for the first five weeks and three per week for the next 26 weeks. The unit cost per text message was derived from commercial price data with an assumed discount of 20% to take into account bulk pricing and local/preferential rates for government.</td>
</tr>
<tr>
<td><strong>T7</strong></td>
</tr>
<tr>
<td>• The methods and assumptions for costing follow those used in the global investment case for tobacco cessation. For more details please see the reference document [16].</td>
</tr>
<tr>
<td>• Nicotine replacement therapy (NRT): NRT unit price data was obtained from the 2019 WHO Report on the Global Tobacco Epidemic [15]. This involved pricing a full 8-week course of therapy that utilized either 532 pieces of gum, or 56 patches, and comparing these prices with GDP per capita. For this analysis the cost of a full course was assumed to be equivalent of 2.0% of GDP per capita in lower middle-income countries, 2.4% for low-income countries, and 1.4% for upper middle-income countries.</td>
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<tr>
<td>• Bupropion / Varenicline: Unit price was derived from a small sample of countries where a 12-week treatment course was estimated by WHO. To standardize the therapy unit price across countries, the price of Bupropion and Varenicline was linked to GDP per capita. The analysis showed that in lower middle-income countries, the cost of a full course averages 8.5% (Bupropion) and 7.5%(Varenicline) of GDP per capita. For this analysis a rate of 1.8% (Bupropion) and 2.8% (Varenicline) was used for upper middle-income countries, and 10% (both) for low-income countries.</td>
</tr>
</tbody>
</table>
References

[1] World Health Organization (2022) MPOWER. Available at: https://www.who.int/initiatives/mpower


