EVIDENCE BRIEF

CVD: Secondary prevention of
Ischaemic heart disease
(DCP4 ID: CVD03-01)
Cluster: Cardiovascular & related disorders

FairChoices
DCP Analytics Tool

CVD, primary prevention with absolute CVD risk > 30% (antihypertensives, statins)

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Description of condition and intervention

Community screening using non-lab-based tools for high blood pressure and overall cardiovascular risk. Blood pressure control medication for those with moderate/severe hypertension and long-term combination therapy (blood pressure medication plus statin) for persons with multiple CVD risk factors. Blood pressure control includes the prescription of one or more of the following: ACEi/ARB, thiazide diuretic, and/or calcium channel blocker, as well as 1 annual lab screening and 2 outpatient visits per year. Primary prevention for individuals with multiple CVD risk factors includes the same ingredients as above except with the addition of a statin. Aspirin was originally recommended in DCP3 as part of combination therapy, but more recent guidelines have shifted away from universal aspirin use. (NCD Countdown appendix).

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
ACC/AHA 2019	Guideline on the primary prevention of CVD	yes

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Intervention attributes

Type of interventions
Prevention

Delivery platform
This intervention may be delivered as part of routine care services predominantly at health centre level.

Equity
In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence
Moderate level of urgency. Treatment outcomes not highly affected by some days of delay.

Population in need of interventions
Eligible population for screening is in the age group 30 to 69 years and in need for the blood pressure regimen is calculated by taking 1.4% of the middle-aged adult population (age 30-

69). The population in need for the multiple CVD risk factor group is 5% of the middle-aged adult population (age 30-69). Based on estimates by Gaziano et al. approximately 5% of middle-aged adults are at high risk for cardiovascular disease. We assume 1.4% of middle-aged adults (30-95+) have severe hypertension but low/moderate absolute CVD risk and would therefore get blood pressure treatment but no statin therapy (Source: NCD Countdown appendix).

Disease state addressed

The disease state addressed by the provision of this intervention are:

Ischemic heart disease (IHD)
Ischemic stroke (IS)
Haemorrhagic stroke (HS)/intracerebral haemorrhage
Hypertensive heart disease

Intervention effect and safety

Table 1: Effect and safety of primary prevention for CVD

Effect of intervention		Certainty of evidence
Mortality (due to condition) reduction Ischemic heart disease (IHD) Ischemic stroke (IS) Haemorrhagic stroke (HS) Hypertensive heart disease	 0.58 0.54 0.49 0.47	See appendix

Model assumptions

Table 2: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Intervention	CVD primary prevention	
Cost calculation		
Treated population	All	Global Burden of Disease study 2019

Gender	Both male & female	
Age	30-69 years	
Treated fraction	0.15	NCD Countdown appendix
Effect calculation		
Affected population		
Affected gender	Both male & female	
Affected fraction age	30 to 99 years	
Affected fraction Ischemic heart disease (IHD) Ischemic stroke (IS) Haemorrhagic stroke (HS) Hypertensive heart disease	 1 1 1 1	
Comparison	No intervention	
Mortality Reduction (RRR**) Ischemic heart disease (IHD) Ischemic stroke (IS) Hemorrhagic stroke (HS) Hypertensive heart disease	 0.58 0.54 0.49 0.47	see table 1

**Relative risk reduction (RRR)

Intervention cost

The cost for CVD risk screening in community settings is estimated to be 1.00 USD per person screened in 2016 in South Africa (source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4795815/). Cost of CVD targeted screening at the facility estimated to be 1.85 USD per case screened in 2016 in LICs (sources: 1) https://apps.who.int/medicinedocs/documents/s21982en/s21982en.pdf; 2) Serje J. 2015. "Estimates of Health Sector Salaries across Four Occupational Levels for UN Member States. Unpublished, WHO, Geneva.; and 3) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4795807/.) The cost of CVD, primary prevention with absolute CVD risk > 30% using antihypertensives and statins, is estimated to be 68.26 USD per patient per year in a specified population in 2012 in Tanzania (source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4869389/).

References

Johansson KA et al 2020: Johansson KA, Coates MM, Økland JM, Tsuchiya A, Bukhman G, Norheim OF, Haaland Ø. Health by disease categories. Distributional Cost-Effectiveness Analysis: Quantifying Health Equity Impacts and Trade-Offs. 2020 Sep 30:105

NCD Countdown appendix

Tolla et al 2016: Tolla et al. Prevention and treatment of cardiovascular disease in Ethiopia: a cost-effectiveness analysis. Cost Eff Resour Alloc. 2016. 14:10

Ngaleson et al 2016: Ngalesoni, F. N., Ruhago, G. M., Mori, A. T., Robberstad, B., & Norheim, O. F. (2016). Cost-effectiveness of medical primary prevention strategies to reduce absolute risk of cardiovascular disease in Tanzania: a Markov modelling study. BMC health services research, 16, 185. doi:10.1186/s12913-016-1409-3

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Appendix

Literature Review for effectiveness & safety

This literature search is an example of Level 1 search for intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, metaanalysis, systematic review, clinical practice guidelines).

Supplementary details (Source: NCD countdown appendix)

Mortality reduction due to IHD:

ACEi+CCB RR=0.655

Statin RR=0.645

IHD RRR = (1-(0.655*0.645)) = 57.8%

Mortality reduction due to ischemic stroke:

ACEi+CCB RR=0.515

Statin RR=0.89

Ischemic stroke RRR = 1-(0.515*0.89) = 54.2%

Mortality reduction due to hemorrhagic stroke:12

ACEi+CCB RR=0.515

Hemorrhagic stroke RRR = 1-0.515 = 48.5%

In a meta-analysis of the effect of treatment to lower blood pressure at different BP levels in primary prevention, we look at the effect size for those with baseline 160 mm Hg or above for severe hypertension: Relative risk of heart failure = 0.53

HHD RRR = (1-0.53) = 47%

Insufficient evidence was found on the impact of primary prevention on Peripheral Artery disease. Further, the attributable deaths were sufficiently low to exclude this pathway from our analysis.

IHD relative mortality reduction = 57.8%

Ischemic stroke relative mortality reduction = 54.2%

Hemorrhagic stroke relative mortality reduction = 48.5%

Hypertensive heart disease relative mortality reduction = 47%

Peripheral artery disease relative mortality reduction = 0%