

# 积极防治心血管疾病，支持“健康中国”建设， 促进经济发展

政策报告：

诺华集团首席执行官

万思瀚博士

版本：2021 年 3 月

## 摘要

中国发展高层论坛为中国政府、全球商业领袖和学术界提供了一个可以充分沟通的重要平台。诺华很荣幸能够每年参加这一盛会。今年大会主题，“迈上现代化新征程的中国”阐述了进入“十四五”规划开局之年后，在技术、社会和经济格局日新月异变化的大背景下所面临的机遇。诺华很高兴看到“十四五”规划把健康作为一个关键要素，并将继续支持“健康中国 2030”的推进。

“健康中国 2030”是一项致力于预防疾病和提升健康水平的重要政策，心血管疾病与之尤其相关。心血管疾病目前仍然是全球以及中国的首要死亡原因。2019 年，约 960 万男性和 890 万女性死于心血管疾病，约占全球死亡人数的三分之一。心血管疾病致死人数最多的国家为中国，其次是印度、俄罗斯、美国和印度尼西亚<sup>1</sup>。

心血管疾病与许多危险因素相关，包括行为因素，如吸烟和肥胖，以及其他健康相关情况，如高脂血症、高血压、老龄化等。通过采取基于人群的整体管理策略来应对这些因素，可以降低心血管疾病的发生，并预防心血管事件

---

<sup>1</sup>Cardiovascular Disease Burden, Deaths Are Rising Around the World, The Journal of the American College of Cardiology, Dec 2020; <https://www.acc.org/about-acc/press-releases/2020/12/09/18/30/cvd-burden-and-deaths-rising-around-the-world>

和死亡。例如，心血管疾病患者或高风险人群需要通过咨询和治疗进行早期检测和管理。

除人力成本外，心血管疾病诊疗也带来了沉重的经济负担。2017 年中国心血管疾病医疗费用为 5400 亿元人民币<sup>2</sup>，占国家卫生总费用的 10%以上，约占全国 GDP 的 0.7%。

30 多年来，中国政府采取了有针对性的措施预防、控制和减少慢性病。虽然在监测危险因素和提高公众意识方面取得了重大进展，但心血管疾病相关发病和死亡仍然维持在一个较高水平。背后的原因是多方面且复杂的，包括诊断不及时、缺乏心血管疾病综合性治疗，以及未完全落实现有诊疗指南和预防措施。

诺华致力于与政策制定者和医疗专业人员合作，在全球范围内改善和推进心脏健康。我们愿意为中国贡献我们在心血管疾病领域的经验和专长，并提出以下建议以期有助于改善中国的心血管健康现状：

(1) 制定包含关键考核指标的具体实施政策，以有效减轻心血管疾病负担

---

<sup>2</sup>张毓辉, 柴培培, 翟铁民, 等. 2017 年我国心脑血管疾病治疗费用核算与分析. 中国卫生经济, 2020, 54 (9): 859-895.

建议充分实施“将健康融入所有政策”理念，并引入可执行的主要考核指标以推动心血管疾病防控。

(2) 探索创新的合作关系模式以提升心血管疾病管理

建立多方合作关系将有助于提升心血管疾病管理能力，并提高心血管疾病治疗可及性。

(3) 提高基层卫生机构的心血管疾病管理能力

提高农村基层卫生水平有助于改善心血管疾病管理，并能有效预防农村地区因健康问题致贫返贫。

我们相信通过建立多方合作关系，着眼于心血管疾病的综合性诊疗与预防，将有助于极大缓解日益严重的医疗和经济负担。我们愿与各方共同努力，一起推动“健康中国 2030”目标的实现。

## 1. 引言

“十四五”期间，中国政府将继续推进《“健康中国 2030”规划纲要》（“健康中国 2030”），并以疾病管理、健全公共卫生应急处理能力、加强疾病预防为重点。“健康中国 2030”重要举措包括提升健康水平、控制主要危险因素、提高医疗服务的能力和质量等。

心血管疾病在中国是一个主要健康问题，这些目标对于心血管疾病领域尤为重要。2019 年，心血管疾病在美国、英国和中国分别占总死亡的 32%、30% 和 43%<sup>3</sup>，是这些国家的首要死亡原因。

心血管疾病是一大类心脏和血管疾病的总称，这些疾病有许多独立危险因素，并会导致严重疾病后果以及相应的高额费用支出，如心脏病发作、卒中、心力衰竭和死亡。导致心血管疾病的危险因素归因于可改变的行为或遗传，行为危险因素包括吸烟、不健康饮食、缺乏运动和过量饮酒。医学危险因素（通常由不健康行为引起）包括肥胖、高血压、糖尿病和高脂血症。普遍认为这些因素引起了心血管疾病相关死亡、发病并由此产生所有相关费用。由于心血管疾病在老年人中更普遍<sup>4</sup>，包括中国在内许多国家人口老龄化趋势导致疾

---

<sup>3</sup>Institute of Health Metrics and Evaluation, <https://vizhub.healthdata.org/gbd-compare/>

<sup>4</sup><https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3297980/>

病负担的增加。世界人口发展趋势使联合国、世界卫生组织和其他国际机构认识到心血管疾病是一个全球性问题，需要用更全面的手段来应对人口老龄化和医疗费用上升带来的影响。

心血管疾病除了是一个公共卫生问题，也成为一个主要社会和经济负担。世界经济论坛估计，2015年心血管疾病的全球总费用为9060亿美元，预计到2025年年度费用将超过1万亿美元<sup>5</sup>。健康状况不佳在微观经济层面对家庭和公司产生影响，也将对一个国家目前和未来的国内生产总值造成宏观经济负面影响。这种影响可以被定量计算，表明成功预防心血管疾病可节省巨大经济成本。

应该采取措施在出现症状前识别出高危患者，并为其提供护理和建议等干预措施。这些行动对于有效预防心血管疾病、改善整体健康水平和降低在微观和宏观经济层面的危害至关重要。

与“健康中国2030”倡议和相关行动计划一致，重视促进公共卫生和疾病预防，代表着从疾病治疗向个人健康整体管理和维护的战略转变。这一努力面临着严峻挑战：预防疾病的有效措施在当前卫生体系中很难实施，因为

---

<sup>5</sup>World Economic Forum. The Global Economic Burden of Non-communicable Diseases, page 22; <https://www.weforum.org/reports/global-economic-burden-non-communicable-diseases>  
Novartis International AG

该体系以治疗已出现症状的患者为主。大多数医疗体系在利益相关方之间缺乏以预防为主的共同目标或激励措施。

我们希望政府和医疗卫生相关方（包括行业）开展基于人群的合作，我们相信针对心血管疾病这类可治可防的疾病，这种具有前景的方案能有效应对其引起的高疾病负担。

## 2. 中国和其他国家现状分析

### 2.1 全球现状分析

#### 2.1.1 心血管疾病死亡数高表明其疾病负担重和经济风险高

##### *疾病负担*

在过去 30 年中，慢性非传染性疾病（慢性病），尤其是心血管疾病，是全球公认的导致过早死亡的首要原因。在全球近 30 年时间里，心血管疾病病例数从 1990 年的 2.71 亿加倍到 2019 年的 5.23 亿，同一时期心血管疾病死亡数从 1210 万上升到 1860 万<sup>6</sup>。

面对过去几十年中如此惊人的数字，世界卫生组织 194 个成员国在 2013 年

---

<sup>6</sup>Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019: Update From the GBD 2019 Study, Journal of the American College of Cardiology, Volume 76, Issue 25, 22 December 2020, Pages 2982-3021

根据“2013-2020 年预防和控制非传染性疾​​病全球行动计划”，就减轻可避免的心血管疾病负担全球机制达成一致意见<sup>7</sup>，旨在通过 9 项自愿性全球目标，到 2025 年将由慢性病导致的过早死亡数降低 25%，其中 2 项目标侧重于预防和控制心血管疾病。全球行动计划包括需要制定行为风险因素应对的战略，支持制定和遵守心血管疾病指南，以及提供获得基本药物和基本技术的医疗相关行动。

然而，2018 年联合国大会非传染性疾​​病问题第三次高级别会议指出，许多国家在 2025 年实现自愿性全球目标方面落后了<sup>8</sup>（图 1）。事实上，经过多年下降，心血管疾病相关死亡率自 2017 年以来在英国和自 2010 年以来在美国都在增长。而中国除了 2006 年和 2007 年有小幅下降，1990 年以来这一死亡率在持续增加。

---

<sup>7</sup>[www.who.int/publications/i/item/9789241506236](http://www.who.int/publications/i/item/9789241506236)

<sup>8</sup>Non-communicable Diseases Country Profiles 2018, WHO report, <https://www.who.int/nmh/publications/ncd-profiles-2018/en>



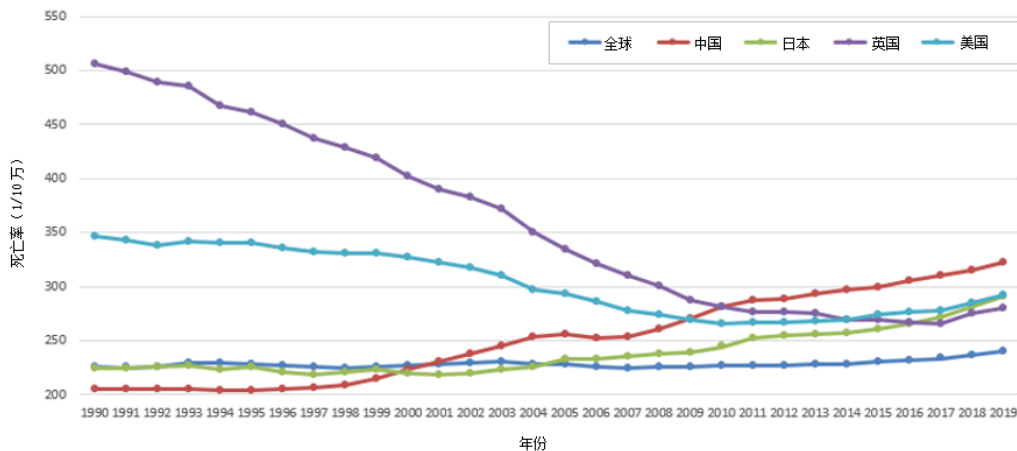


图 1 1990 年至 2019 年期间，全球和部分国家心血管疾病死亡率曲线<sup>9</sup>。来源：健康测量与评价中心 GBD 工具。

### 经济负担

除了心血管疾病的巨大个人负担外，这些疾病及其治疗还产生较高经济支出。2010 年，心血管疾病所耗费的全球费用将近 8630 亿美元（平均人均费用为 125 美元），估计 2030 年费用将达到 1.04 万亿美元，增加 22%。总体而言，在 20 年间心血管疾病支出可能高达 20 万亿美元（平均人均费用近 3000 美元）。目前约 4740 亿美元（55%）用于直接医疗费用，其余 45%是由于残疾或过早死亡导致的劳动力损失，或由于疾病或陪护导致的工作时间损失<sup>4</sup>。

<sup>9</sup><https://vizhub.healthdata.org/gbd-compare/>  
Novartis International AG

2017 年，欧洲心脏网络估计心血管疾病对欧盟年度经济影响约为 2100 亿欧元，其中约 53%（1110 亿欧元）为直接医疗费用，26%（540 亿欧元）归因于生产力损失，21%（450 亿欧元）为家庭成员陪护产生的费用<sup>10</sup>。在美国，在 2035 年心血管疾病相关年度直接医疗费用将上升至 7490 亿美元，而劳动力损失费用将达到 3680 亿美元<sup>11</sup>，全部费用每年可达 1.1 万亿美元。

### 2.1.2 完善心血管疾病防控的全球和国家项目

尽管已取得一些进展，但各国在心血管疾病负担减轻方面仍面临重大挑战，包括某些危险因素广泛存在（如肥胖和糖尿病）、心血管疾病危险因素延迟诊断、治疗依从性差、人口老龄化，老年人医疗卫生需求不断增加，以及无法获得足够的专业照护。变革医疗卫生系统以更好地预防、治疗和管理心血管疾病将有助于成功降低心血管疾病死亡率。

各国在持续努力，2020 年联合国大会启动了《2020-2030 年健康老龄化行动十年》<sup>12</sup>，该行动致力于聚集政府、民间社会、国际组织、专家、学者、媒体和私立机构等共同努力改善老年人、其所在家庭和居住社区的生活，包括收集和分析来自服务设施的健康老龄化数据，解决老年人健康照护培训与突发

---

<sup>10</sup>CVD Statistics 2017, <http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html>

<sup>11</sup>Cardiovascular disease: a costly burden for America. Projections through 2035 (2017). American Heart Association;<https://healthmetrics.heart.org/cardiovascular-disease-a-costly-burden/>

<sup>12</sup><https://www.who.int/initiatives/decade-of-healthy-ageing>, <https://www.who.int/docs/default-source/decade-of-healthy-ageing/final-decade-proposal/decade-proposal-final-apr2020-en.pdf>

状况下老年人独特需求之间的差距，并协调服务提供方进行老年人照护。该行动还为利益相关方提供一个平台促进国家间行动，分享信息和指导，开展能力建设。虽然该计划并非仅聚焦心血管疾病，但其实施有助于促进早期检测、治疗、预防心血管疾病这一老年人群中心脏病和卒中的常见原因。

英国国家医疗服务体系于 2018 年制定了一个长期计划<sup>13</sup>，心血管疾病被确定为临床优先，及未来 10 年最有潜力挽救生命的因素。该计划寻求在 10 年内预防超过 15 万例的心脏病发作、中风和痴呆发生。它概述了国家医疗服务体系、自愿性组织和社区部门的合作伙伴，以及包括医学会在内的其他国家组织如何能共同努力实现这一目标。具体来说，该计划致力于通过降低有害的低密度脂蛋白胆固醇作为预防心血管疾病关键措施，并为心血管疾病早期检测和治疗提供策略，与社区药剂师和全科医生合作，通过检测高血压和其他指标（包括基因指标）评估患者风险，还为高风险个体提供预防性治疗。

英国还制定了国家生命科学产业战略变革国家医疗系统，利用风险和分层方法（一种基于健康和其他因素对患者及其需求进行分类的方法）更早识别疾病。过去几年中，英国国家医疗服务体系通过扩大准入加速协作论坛（在英

---

<sup>13</sup><https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/cardiovascular-disease/>

国为鼓励健康创新而建立)加速批准了一些最有前景的新药和健康技术<sup>14</sup>, 目标之一是开发寡核苷酸制造平台, 增加产能, 降低成本, 并降低对环境的影响。2020年1月, 诺华宣布通过一个制造业联盟与英国国家医疗服务体系合作, 解决心血管疾病相关问题, 帮助该国实现英国国家医疗服务体系长期计划和国家生命科学产业战略制定的目标<sup>15</sup>。

美国疾病预防控制中心心脏病和卒中预防处制定了控制心血管疾病的合作协议, 旨在预防、管理和减少心脏病和卒中, 重点是减少危险因素, 缩小州、地方和部落公共卫生部门内的健康差异, 并加强监测和实施研究。作为签署于2018年为期5年的合作协议的一部分, 卫生部门将利用临床数据来提高治疗依从性, 促进高血压和高胆固醇血症患者的自我管理和生活方式改变<sup>16</sup>。2018年, 美国疾病预防控制中心资助州和地方卫生部门设计、测试和评估解决糖尿病、心脏病和卒中等疾病负担的创新方法, 还开发新方法识别高血压和高血脂患者, 实施社区项目, 扩大远程医疗, 并增强心脏康复计划中患者的转诊和依从性。

---

<sup>14</sup>Life Sciences Industrial Strategy Update ([publishing.service.gov.uk](https://publishing.service.gov.uk))

<sup>15</sup>Media Release, Novartis announces intent to collaborate with NHS England to tackle burden of cardiovascular disease in the UK January 13, 2020

<sup>16</sup><https://www.cdc.gov/dhdsp/programs/spha/overview.htm>

## 2.2 中国现状分析

### 2.2.1 心血管疾病死亡数高表明其疾病负担重和经济风险高

#### *疾病负担*

中国疾病预防控制中心将慢性病定义为病情持续时间长、发展缓慢的疾病，4 个主要类型为：心血管疾病（如心脏病发作和中风）、糖尿病（心血管疾病的独立危险因素）、癌症和慢性呼吸道疾病<sup>17</sup>。

与全球一致，中国心血管疾病的发病和死亡在不断增加。国家心血管病中心数据显示 2019 年中国约有 3.3 亿心血管疾病患者，约占全国人口的四分之一。与其他疾病（包括恶性肿瘤）相比，心血管疾病是我国居民首要死因。2017 年，农村和城市心血管病分别占死因的 46%和 43%<sup>18</sup>。

纵观心血管疾病不同类型，过去 30 年里动脉粥样硬化性心血管疾病一直是导致死亡的首要原因，死亡率和发病率均在增加（图 2a、2b）<sup>19</sup>。

---

<sup>17</sup><http://www.chinacdc.cn/jkzt/mxfcrjhbsh/>

<sup>18</sup>中国心血管健康与疾病报告 2019

<sup>19</sup>Zhao, D., Liu, J., Wang, M. et al. Epidemiology of cardiovascular disease in China: current features and implications. *Nat Rev Cardiol* 16, 203–212 (2019). <https://doi.org/10.1038/s41569-018-0119-4>

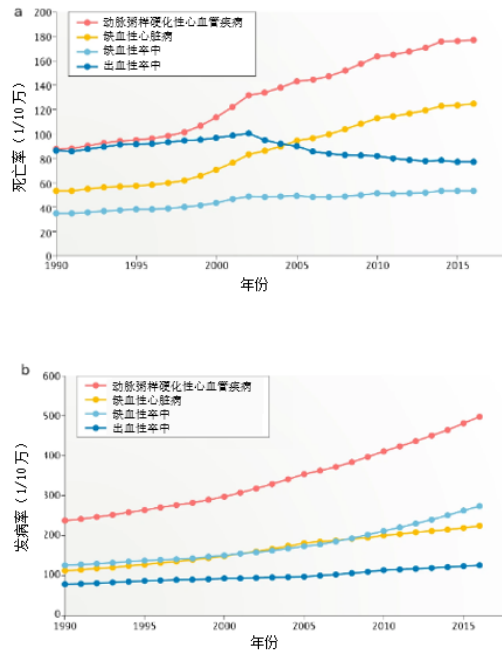


图 2 中国心血管疾病死亡率和发病率趋势<sup>6</sup>: a) 动脉粥样硬化性心血管疾病、缺血性心脏病、缺血性卒中和出血性卒中死亡率。b) 动脉粥样硬化性心血管疾病、缺血性心脏病、缺血性卒中和出血性卒中发病率。数据来自健康测量与评价中心 2018 年全球健康数据交换的全球疾病负担研究开放数据库。

### 经济和社会经济负担

心血管疾病病例数上升直接导致相关支出增加。2012 年至 2016 年间，心血管疾病医疗费用从 3100 亿元人民币增长到 4950 亿元人民币，平均每年增长

11%<sup>20</sup>。2017 年医疗费用达 5400 亿元人民币，占国家卫生总费用的 10%以上<sup>21</sup>，约占 GDP 的 0.7%。虽然心血管疾病支出占卫生总费用的比重有所下降，但其费用金额在显著增加。事实上，人口老龄化相关支出比经济增长更快，引起更多关注。中国老年健康研究报告（2018）估计 2015 年至 2050 年间，中国老年护理的社会总支出，包括医疗、福利和设施，将从占 GDP 的 7%增加到 26%<sup>22</sup>。一项 2016 年研究估计在 2016 年至 2030 年间，对中国高血压和血脂异常患者进行系统治疗可在 15 年内减少数以百万的心血管疾病死亡，产生 9320 亿美元的经济价值<sup>23</sup>。

### 2.2.2 完善心血管疾病防控措施和政策

20 世纪 90 年代以来，中国政府探索开展了慢性病防治的可行性模式和措施，1996 年试点开展慢性病社区防控项目，1997 年在全国建立 34 个社区慢性病综合防控示范点，2010 年启动国家慢性病综合防控示范区建设项目，综合管理心血管疾病、高血压和糖尿病。这些措施的实施取得了诸多成效：

---

<sup>20</sup>张毓辉, 柴培培, 翟铁民, 等. 我国心脑血管疾病治疗费用核算及预测研究. 中国卫生经济, 2019, 38, (5): 18-22.

<sup>21</sup>张毓辉, 柴培培, 翟铁民, 等. 2017 年我国心脑血管疾病治疗费用核算与分析. 中国卫生经济, 2020, 54 (9): 859-895.

<sup>22</sup>中国老年健康研究报告（2018）

<sup>23</sup>Stevens et al. BMC Health Services Research (2016) 16:175

- (1) *危险因素监测*。2002 年建立综合监测系统调查居民健康状况，覆盖居民死因、慢性病及其危险因素、居民营养状况等<sup>24</sup>。2004 年至 2018 年间开展了 5 次全国慢性病及其危险因素监测，收集了大量流行病学数据，包括代谢、环境、遗传不可改变和容易改变的危险因素。按照与心血管疾病的相关性降序排列，可改变的危险因素包括高血压、吸烟、血脂异常（包括低密度脂蛋白胆固醇升高）、糖尿病、肥胖、缺乏运动和不健康饮食。这些可改变危险因素推动了心血管疾病死亡、发病和医疗费用的增加。
- (2) *健康意识*。随着调查的开展，居民健康意识不断提高。例如，高血压知晓率从 2002 年的 30% 提高到 2015 年的 52%。18 岁或以上人群中糖尿病知晓率从 2002 年的 6% 提高到 2013 年的 36%，血脂异常知晓率从 2002 年的 3% 提高到 2010 年的 31%。高血压规范管理人数也由 2010 年的 4220 万人增长至 2016 年的 9020 万人。
- (3) *心血管疾病防治机构建立*。设立了一批机构指导全国慢性病防治工作，包括中国疾控中心慢病中心、国家癌症中心、国家心血管病中心，约 50% 省份建有慢性病防治办公室。医联体的建立或不断扩大，胸痛中心和卒中中

---

<sup>24</sup><http://www.nhc.gov.cn/jkj/s7915v/201504/15695dca75d74dc48a7f2b6ded188c63.shtml>  
Novartis International AG



心的建设，共同促进心血管疾病分级诊疗。2017年以来，国家在地市级城市开展医联体建设促进分级诊疗，不断加强基层慢性病防控。

国家在2016年发布“健康中国2030”蓝图，在2019年制定了《健康中国行动（2019—2030年）》（健康中国行动），提出开展15个重大专项行动，其中4项与心血管疾病防控相关。健康中国行动和《中国防治慢性病中长期规划（2017—2025年）》均设定了2022年、2025年和2030年要达到的心血管疾病死亡率目标（表1）。

表1 相关政策（“健康中国2030”、健康中国行动、《中国防治慢性病中长期规划（2017—2025年）》）设定的心血管疾病重点指标

目标/年份	因慢性病导致的过早死亡率 (%)	死亡率 (1/10万)	高血压患者规范管理率 (%)	35岁及以上居民年度血脂检测率 (%)
2015 (基线)	18.5	238.4	50	19.4 (2012)
2022	≤15.9	≤209.7	≥60	27
2025	≤14.8	≤205.1	≥70	≥30

2030	≤13	≤190.7	≥70	35
到 2030 年	-30	-20%	+40	+80
的				
变化				

健康中国行动呼吁慢性病管理需要政府、社会、家庭和个人都要行动起来，共担健康责任。《中国居民营养与慢性病状况报告（2020 年）》显示，2019 年四类重大慢性病导致的过早死亡率从 2015 年的 18.5% 下降到 16.5%，几乎达到了 2022 年设定目标 15.9%。然而，心血管疾病相关费用和死亡仍在持续上升。

### 2.2.3 心血管疾病疾病负担较重，防控还需更大努力

“健康中国 2030”和其他政策的实施降低了心血管疾病相关危险因素并提高了居民健康意识，但仍存在一些问题，心血管疾病疾病负担降低进展缓慢。三个主要问题集中在能力、实施预防措施和老年护理。

#### *基层医疗机构能力不足*

健康中国行动提出综合防控心血管疾病危险因素，包括高血压、高胆固醇和高脂血症，即“三高共管”。然而，三高仍然是个体化治疗，通常在医院不同

科室进行，很少考虑与心血管疾病关联，因此在做出直接心血管疾病诊断之前，医生对个体健康的影响是有限的。此外，许多基层医疗机构诊疗能力不强，不足以有效控制三高，偏远和欠发达地区情况更差。诊断延误、治疗依从性不足和无法及时获得专科照护制约了有效防控心血管疾病。虽然高血压知晓率在 2015 年达到 52%，但控制率仍然相对较低（仅 17%）。2013 年糖尿病控制率也较低，为 16%。使用现有治疗指南提高医疗服务系统预防、治疗和管理心血管疾病的能力将有助于降低死亡率。

### *预防措施重视不足*

健康中国行动提出对高危人群进行风险评估和早期干预以高效预防心血管疾病，而医疗系统目前更关注那些已被诊断为心血管疾病的患者，未早期或长期关注健康人群或心血管疾病风险人群，尤其高脂血症人群。例如，在体检中须进行血脂检查，评估甘油三酯、总胆固醇、高密度脂蛋白胆固醇和低密度脂蛋白胆固醇的水平，然而血脂异常并未能得到医生和患者足够重视，随访工作不够，随着时间推移可能导致出现更严重的健康问题。同样，定期糖尿病筛查和早期干预有助于预防心血管疾病这一常见并发症的发生。

### *老年照护需要更多关注*

在中国，人口老龄化是心血管疾病发病率较高的因素之一。2000 年至 2018 年

间，全国 60 岁及以上老年人口占总人口的比例从 10% 上升至 18%，65 岁及以上老年人口占总人口的比例从 6.8% 上升至 11%<sup>20</sup>。预计这一趋势将持续存在，不断加重国家心血管疾病负担。有研究<sup>25</sup>指出 2016 年中国 60 岁及以上老年人口中，58% 患有高血压，19% 患有糖尿病，11% 患有高胆固醇血症，5% 患有卒中，76% 至少患有一种慢性病。国家心血管病中心 2018 年发布的报告估计，即使心血管疾病危险因素水平保持不变，2010 年到 2030 年，仅人口增长和老龄化就会使心血管病事件（心绞痛、急性心肌梗死、心脏性猝死和脑卒中）的发生数上升 50% 以上<sup>26</sup>。

### 3. 观点和建议

近年来，中国政府在医疗健康方面取得了令人瞩目的成就。将健康上升为国家战略，一系列政策和指南的实施为医疗体制改革铺平了道路。十余年来，全民医疗服务体系和医疗保障体系已逐步建立，各级政府加速推进疾病预防控制工作，公民健康水平和预期寿命大幅提高。“健康中国 2030” 建设加强疾病管理、健全公共卫生应急处理能力和加强疾病预防，包含实现疾病综合

---

<sup>25</sup>王丽敏, 陈志华, 张梅, 等. 中国老年人群慢性病患病状况和疾病负担研究. 中华流行病学杂志, 2019,40(3):277-283.

<sup>26</sup>中国心血管病报告 2018

管理、建立分级诊疗和建设医联体。全国范围开展监测有助于识别危险因素和为治疗提供基于数据的证据。

然而，由于人口老龄化和心血管疾病医疗、社会和经济负担的不断加重，从长远角度来看我国心血管疾病管理仍面临一些挑战。为了更好地满足心血管疾病防控需求，特提出如下解决中国心血管疾病负担问题的短期及长期建议：

- (1) 制定包含关键考核指标的具体实施政策，以有效减轻心血管疾病负担
- (2) 探索创新的合作关系模式以提升心血管疾病管理
- (3) 提高基层卫生机构心血管疾病管理能力

### 3.1 制定包含关键考核指标的具体实施政策，以有效减轻心血管疾病负担

中国政府在新型冠状病毒肺炎大流行期间采取的早期和强有力行动是控制疫情的关键。我们相信也需要同样强大的政府干预来应对心血管疾病造成的医疗和经济负担。2016年，中国国家主席习近平强调“将健康融入所有政策”，即将健康融入其他部门公共政策的制定。这一理念<sup>27</sup>最早可追溯到世界卫生组织在1978年促进部门间的健康行动，它系统地考虑到各项决定对健康和卫生系统的影响，寻求协同作用，避免对健康的负面影响，以改善人群健康和

---

<sup>27</sup>[https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/188809/Health-in-All-Policies-final.pdf](https://www.euro.who.int/__data/assets/pdf_file/0007/188809/Health-in-All-Policies-final.pdf)  
Novartis International AG

卫生公平。此外，它还增加各级政府政策制定者对健康影响的责任。

根据“将健康融入所有政策”，“健康中国 2030”确定了政府、社会、个人和家庭共担健康责任，解决慢性病（包括心血管疾病）相关需求。心血管疾病相关指标和其危险因素（高血压、高脂血症和糖尿病）的综合管理已被纳入“健康中国 2030”。然而该规划并未明确在具体实施时不同利益相关方之间的政策和工作如何保持一致。为解决这一问题，应参考新型冠状病毒肺炎应对模式，需要中央政府的强大领导力。

因此，我们建议建立实施全面的心血管疾病防治工作规划，确定不同利益相关方的关键考核指标，这些指标应可执行且可测量。例如，提高血脂检测率已作为一项指标纳入“健康中国 2030”（表 1）。基于对现有危险因素的认识，政策需要明确血脂检测中不同脂质亚型指标，如甘油三酯、总胆固醇、高密度脂蛋白胆固醇、低密度脂蛋白胆固醇。还应在诊疗指南实施、医疗机构人员和设备资质、公民参与引入关键考核指标，以最终成功实现健康目标。由于老年人群特别容易罹患心血管疾病，所以加强老年人群慢性病和心血管疾病健康管理监测的指标至关重要。

在各级政府引入关键考核指标将有力支持“健康中国 2030”目标的实现。

### 3.2 探索创新的多方合作关系模式以提升心血管疾病管理

中国政府降低心血管疾病负担的努力有助于提高公众对高血压和糖尿病的认识。然而，由于人口老龄化和文中提到的结构性限制，心血管疾病发病率和死亡率仍在持续上升。

大多数心血管疾病是可以预防的，我们希望与中国政府合作，利用一种突破传统医学界限和实践的系统思维方式，与不同利益相关方探索建立一种新型多方合作关系。我们相信，更大范围的利益相关方（包括传统医疗健康部门之外的公司）可以共同探讨合适的激励措施，让更多公民参与到自身健康管理中。

这种合作关系可实现心血管疾病的全面预防，主要得益于各方致力于共同目标，积极识别危险因素，在不同人群中应用差异化预防方案，并通过引入心血管疾病筛查和诊断新技术来避免风险。这种合作关系将促进更全面管理心血管疾病和相关慢性病（如糖尿病、高血压和高脂血症，其已写入健康中国行动）。它还将加速患者获得潜在变革性治疗方法，改善健康结局，为数百万心血管疾病患者带来希望，并最终通过避免心血管事件和入院降低对医疗卫生系统的经济负担。

我们相信政府、行业和各界形成的新型伙伴关系将改善长期控制心血管疾病并促进经济增长，有助于实现健康中国行动制定的关键目标。

### 3.3 提升基层医疗机构的心血管疾病管理能力

我们很高兴地看到政府重视初级卫生保健工作，医改相关措施包括建立分级诊疗，由基层卫生服务机构管理慢性病患者。由于农村地区心血管疾病发病率和死亡率高于城市，农村地区的初级医疗需要特别关注和更多投入。这也符合乡村振兴战略，这一发展蓝图致力于提高村卫生室和县级医院的健康管理，服务于包括老年人在内的不同人群的健康需求<sup>28</sup>。

由于基层卫生机构在心血管疾病防控中发挥着关键作用，我们认为其应是上述新型合作关系的重点。例如，基层卫生可以从系统培训课程中获益，该课程包括现行诊疗指南、慢性病和心血管疾病诊疗标准、老年护理，以及更好的理解心血管疾病患者合并症相关的行为和其他危险因素。应保证医疗基础设施，如筛查设备、影像技术和高质量药物供应，以实现最佳诊断和治疗效果。

合作关系计划有助于开发一个体系，去连接医疗资源，促进医疗人员交流，以及支持不同医院和诊疗中心建立联盟，特别是与基层卫生机构合作，将提高诊疗标准，并促进更好地了解 and 遵守国家心血管疾病诊疗指南。这些计划

---

<sup>28</sup>[http://www.gov.cn/zhengce/2021-02/21/content\\_5588098.htm](http://www.gov.cn/zhengce/2021-02/21/content_5588098.htm)



可以以先进的数字工具作为补充，如互联网医院、远程医疗、网上药房和人工智能技术，帮助提升诊断水平、识别危险因素和治疗依从性。

中国在 2020 年底实现了“十三五”期间确定的扶贫目标，人民生活水平有了很大改善，这也包括健康状况。考虑到心血管疾病的长期医疗负担和经济影响，我们建议将心血管疾病管理纳入未来的健康扶贫措施中，包含减少个人危险因素、加强基础设施建设和提升卫生工作者能力。

从长期来看，提高农村基层卫生机构的心血管疾病防控能力将有助于减轻疾病负担，防止因病致贫返贫，从而支持“健康中国 2030”目标的实现。

#### **4. 结论**

诺华致力于提供基于科学的医疗创新，并支持中国政府在医疗卫生领域的持续努力。我们致力于提供创新的解决方案和伙伴关系，这对实现“健康中国 2030”目标非常有价值。

由于心血管疾病是全球和中国的首要死亡原因，并且中国心血管疾病发病率正在稳步升高，我们建议中国政府建立创新的多方合作关系，建设一个综合管理体系，通过预防和治疗解决心血管疾病危险因素。只有通过政府、行业和其他利益相关方的伙伴关系，才能成功应对心血管疾病的巨大社会和经济

负担。诺华致力于加强与中国政府合作，寻找改善心血管疾病长期控制和促进经济增长的新方法，推动“健康中国 2030”主要目标的实现。

# **Preventing Cardiovascular Disease to support *Healthy China 2030* goals and promote economic development in China**

Paper presented by:

Dr. Vas Narasimhan, Chief Executive Officer of Novartis

FINAL March 2021

## Executive Summary

The China Development Forum is an important platform that enables the Chinese government, global business leaders, and scholars to engage in meaningful discussions, and Novartis is honored to participate each year in this valuable assembly. This year's theme, "China on a New Journey of Modernisation," highlights the opportunities at hand in 2021 as the country enters the first year of its 14<sup>th</sup> Five-Year Plan amid rapidly changing technologies and social and economic landscapes. Novartis is heartened that the plan highlights health as a critical element and supports the continuation of the *Healthy China 2030* initiative.

*Healthy China 2030* is an important policy framework that strives to prevent disease and promote improved health. The initiative is particularly relevant to cardiovascular disease (CVD), which remains the leading cause of death globally, as well as in China. Worldwide in 2019, CVD was the underlying cause of 9.6 million deaths among men and 8.9 million deaths among women, together around a third of all deaths. The highest number of CVD deaths occurred in China, followed by India, Russia, the United States, and Indonesia<sup>29</sup>.

CVD is linked to many risk indicators. These include behavioral factors, such as

---

<sup>29</sup>Cardiovascular Disease Burden, Deaths Are Rising Around the World, The Journal of the American College of Cardiology, Dec 2020; <https://www.acc.org/about-acc/press-releases/2020/12/09/18/30/cvd-burden-and-deaths-rising-around-the-world>

smoking and obesity, as well as other health related conditions such as hyperlipidemia, hypertension, and aging. CVD incidence can be reduced and many cardiovascular events and fatalities prevented by addressing these factors using a holistic management approach driven by population-wide strategies. For example, people with CVD or who are at high risk need early detection and management using counselling and treatments.

In addition to the human cost, the country's high CVD burden also carries a significant economic price. In China, total medical expenditure for CVD in 2017 was RMB 540 billion<sup>30</sup>, just more than 10% of China's total expenditure on health and equal to about 0.7% of national GDP.

Over the past 30 years, the Chinese government has taken targeted measures to reduce, prevent, and control chronic disease. While great progress in monitoring risk factors and improving public awareness is noticeable, CVD related incidence and mortality remain high. The reasons are multifaceted and complex, and contributing factors include the absence of comprehensive CVD treatment, frequent late diagnosis, and a disparate adherence to available treatment guidelines and preventative measures.

Novartis is committed to working with policy makers and healthcare professionals

---

<sup>30</sup>Zhang YH. Chai PP. Zhai TM. Wan Q. Accounting and Analysis of China CVD Medical Cost in 2017. China Health Economics. 2020, 54 (9):859-865

to improve and advance heart health around the world. In this light, we would like to contribute our experience and expertise in the field of CVD to China's efforts and propose to the Chinese government to take the following steps in the hope of helping improve cardiovascular health in China:

- (4) Establish policies with key performance indicators (KPIs) to effectively address the CVD burden

The Chinese government is proposed to fully embrace the *Health in All Policies* concept connected to defined KPIs to drive effectively control and prevention of CVD.

- (5) Explore innovative partnership models to improve CVD management

The establishment of multi-sectoral partnerships will help to raise capabilities in CVD management and allow improved access to treatment.

- (6) Elevate CVD management capabilities at the primary care level

Special government attention to rural primary care will support improved CVD management and prevent health-related poverty in rural areas.

Novartis believes there is substantial opportunity to address the growing medical and economic threat caused by CVD through multi-sectoral partnerships that focus on holistic treatment concepts and prevention. We welcome the opportunity to contribute to and support the Chinese government's effort toward the goals of

*Healthy China 2030.*

## 5. Introduction

In the upcoming Five-Year-Plan period, the Chinese government will continue to advance the Healthy China 2030 initiative that focuses on managed care, strengthening the early response system to health threats, and preventing disease. Important initiatives targeted in Healthy China 2030 include improving health, controlling major risk factors, and increasing and improving the capacity and quality of health service provision.

These targets are critical in the area of cardiovascular disease (CVD), a major health issue in China. In China and elsewhere in 2019, CVD was the leading cause of death, responsible for 32% of all deaths in the United States, 30% in the United Kingdom, and 43% in China<sup>31</sup>.

CVD is a general term for a group of disorders of the heart and blood vessels. These disorders have many independent risk factors and lead to severe and costly outcomes such as heart attacks, strokes, heart failure, and death. Some of the risk factors leading to CVD are attributed to behaviors that can be modified or genetic conditions. Behavioral risk factors include tobacco use, unhealthy diet, lack of exercise, and excessive alcohol consumption. Medical risk factors, which are often triggered by unhealthy behavior, include obesity, hypertension, diabetes, and

---

<sup>31</sup> Institute of Health Metrics and Evaluation, <https://vizhub.healthdata.org/gbd-compare/>  
Novartis International AG



hyperlipidemia. These factors are widely understood to contribute to deaths, morbidity, and overall costs associated with CVD. As CVD is more prevalent in older people<sup>32</sup>, aging population trends in many countries, including China, are likely to contribute to an increasing disease burden. World demographic trends have led the United Nations, the World Health Organization (WHO), and other international institutions to recognize CVD as a global problem, requiring a comprehensive approach to manage the impact of aging populations and rising healthcare costs.

In addition to being a public health issue, CVD is also a major social and economic burden. The World Economic Forum (WEF) estimates that in 2015 CVD generated a global cost of USD 906 billion and the annual cost was forecast to surpass USD 1 trillion in 2025<sup>33</sup>. Poor health has a microeconomic impact affecting households and companies, as well as an aggregate macroeconomic effect that burdens a country's current and future gross domestic product (GDP). This aggregate impact can be calculated quantitatively and shows the significant economic opportunity available with successful progress toward CVD prevention.

Urgent action is needed to identify at-risk patients before symptoms arise and provide them with adequate intervention, including care and advice. Such action is

---

<sup>32</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3297980/>

<sup>33</sup> World Economic Forum. The Global Economic Burden of Non-communicable Diseases, page 22; <https://www.weforum.org/reports/global-economic-burden-non-communicable-diseases>

critical to prevent CVD effectively, improving overall health and mitigating harm at the micro- and macro-economic levels.

Aligned with the *Healthy China 2030* initiative and related action plan, a clear focus on promoting public health and disease prevention represents a strategic shift from disease treatment to the holistic management and maintenance of individual health. The effort faces a crucial challenge: effective measures for preventing disease are difficult to implement in health systems today because these systems are mainly reactive and treat patients who are already sick. Most healthcare systems lack alignment amongst the relevant stakeholders on goals or incentives to foster prevention.

Novartis supports partnerships between governments and other relevant healthcare stakeholders, including industry, to develop tailored programs focused in the general population and believes this represents a promising approach to address the high disease burden of CVD that is both treatable and preventable.

## **6. Situational analysis in China and other countries**

### 2.1 Global situation

#### 2.1.1 Alarming numbers of CVD deaths illustrate high disease burden and economic risk

##### *Disease burden*

For the past 30 years, non-communicable diseases (NCDs) – and particularly CVD – have been recognized as the leading cause of premature death globally. Over almost three decades worldwide, cases of CVD nearly doubled from 271 million in 1990 to 523 million in 2019. Over the same period the number of CVD deaths rose steadily from 12.1 million to 18.6 million<sup>34</sup>.

Faced with such alarming figures, all 194 member states of the WHO agreed in 2013 on global mechanisms to reduce the avoidable NCD burden under a "Global action plan for the prevention and control of NCDs 2013-2020"<sup>35</sup>. The plan aimed to reduce the number of premature deaths caused by NCDs by 25% by 2025 through nine voluntary global targets, including two that focused on preventing and controlling CVD. The global plan includes the need for setting up strategies to address behavioral risk factors, as well as medical-related actions that support the creation of and adherence to CVD guidelines, and providing access to essential medicines and technologies.

In 2018, however, the third high-level meeting on NCDs of the UN General Assembly concluded that many countries were behind in their efforts to achieve the voluntary global targets by 2025<sup>36</sup> (Figure 1). Indeed, after years of decline, the

---

<sup>34</sup> Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019: Update From the GBD 2019 Study, *JACC*, Volume 76, Issue 25, 22 December 2020, Pages 2982-3021  
*Journal of the American College of Cardiology*

<sup>35</sup> [www.who.int/publications/i/item/9789241506236](https://www.who.int/publications/i/item/9789241506236)

<sup>36</sup> Non-communicable Diseases Country Profiles 2018, WHO report, <https://www.who.int/nmh/publications/ncd-profiles-2018/en>

incidence of CVD-related deaths has grown since 2017 in the United Kingdom and since 2010 in the United States. In China, the death rate has continually increased since 1990, with the exception of a small downturn in 2006 and 2007.

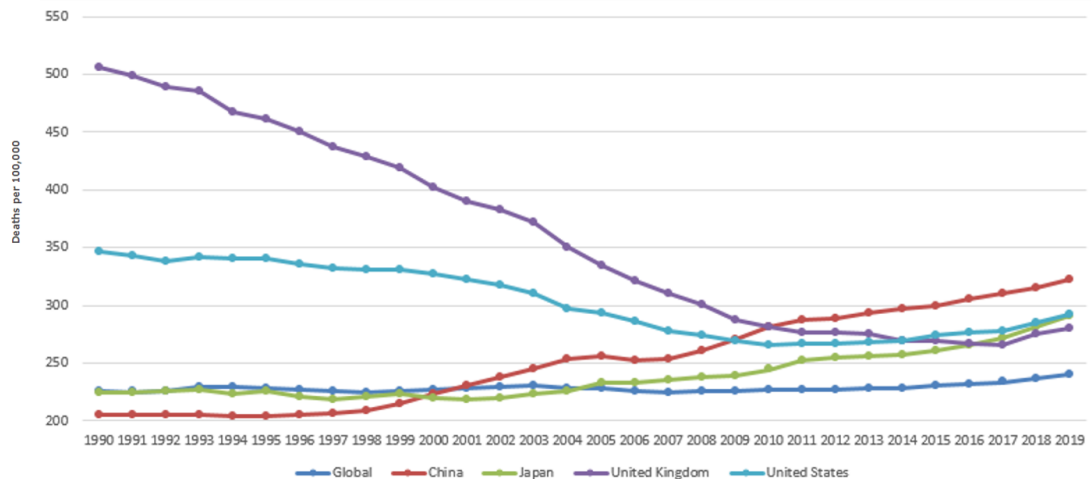


Figure 1: Development of rates of death caused by CVD in selected countries between 1990 and 2019<sup>37</sup>. Source: GBD tool Institute of Health Metrics and Evaluation.

### *Economic burden*

In addition to the substantial personal burden of CVD, these diseases and their treatments carry high economic costs. The global cost of CVD in 2010 was estimated at USD 863 billion or an average per capita globally of USD 125, and it was estimated to rise to more than USD 1 trillion in 2030 – an increase of 22%.

<sup>37</sup> <https://vizhub.healthdata.org/gbd-compare/>  
Novartis International AG

Overall, the accumulated cost for CVD could be as high as USD 20 trillion over the 20-year period or an average per capita cost globally of nearly USD 3,000. Currently about USD 474 billion or 55% of this burden is due to direct healthcare costs and the remaining 45% to productivity loss from disability, premature death, and time lost from work because of illness or the need to seek care<sup>4</sup>.

In 2017, the European Heart Network estimated the annual impact of CVD on the EU economy to be approximately EUR 210 billion. Of this amount, about 53% or EUR 111 billion were direct health care costs, 26% or EUR 54 billion were attributed to productivity losses, and 21% or EUR 45 billion were costs linked to informal care by family members<sup>38</sup>. In the United States, annual direct medical costs associated with CVD are projected to rise to USD 749 billion by 2035, while lost productivity costs could reach USD 368 billion annually<sup>39</sup>. Together the total cost could reach USD 1.1 trillion a year in the United States.

### 2.1.2 Global and national programs to improve control and prevention of CVD

Although incremental progress has been achieved, countries continue to face significant challenges with regard to their efforts to reduce the burden of CVD. These include: a greater prevalence of certain risk factors, such as obesity and

---

<sup>38</sup> CVD Statistics 2017 <http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html>

<sup>39</sup> Cardiovascular disease: a costly burden for America. Projections through 2035 (2017). American Heart Association; <https://healthmetrics.heart.org/cardiovascular-disease-a-costly-burden/>

diabetes; delays in diagnosing CVD risk factors; unsatisfactory adherence to recommended treatments; aging populations with increasingly complex healthcare needs; and insufficient access to specialized care. Changes in healthcare systems to better prevent, treat, and manage CVD will help to successfully reduce CVD related mortality rates.

Several efforts are underway. In 2020, the UN General Assembly launched the *Decade of Healthy Ageing 2021-2030*<sup>40</sup>. This program seeks to bring stakeholders together, including governments, civil societies, international agencies, professionals, academics, the media, and the private sector, in a concerted effort to improve the lives of the elderly, their families, and their communities. The program includes collection and analysis of data on healthy aging from service facilities, addresses gaps in training on health provision for older people and their unique needs in emergencies, and provides coordination of care for older people among service providers. The *Decade* program also provides a platform for stakeholders to promote actions within countries, share information and guidance, and build capabilities. While the program is not specifically centered on CVD, its implementation may help improve early detection and treatment, as well as prevent CVD as a common cause of heart attacks and strokes in the elderly population.

---

<sup>40</sup> <https://www.who.int/initiatives/decade-of-healthy-ageing>, <https://www.who.int/docs/default-source/decade-of-healthy-ageing/final-decade-proposal/decade-proposal-final-apr2020-cn.pdf>  
Novartis International AG

In the United Kingdom in 2018, the National Health Service (NHS) established the *Long-Term Plan*<sup>41</sup> that identifies – among many other features – CVD as a clinical priority and the condition with the greatest potential to save lives over the next 10 years. The plan seeks to prevent more than 150,000 heart attacks, strokes, and dementia cases over a decade. It outlines how the NHS, its partners in the voluntary and community sectors, and other national organizations, including medical associations, can work to achieve this goal. Specifically, the program targets reducing harmful low-density lipoprotein (LDL) cholesterol as a critical measure to prevent CVD and provides strategies for early detection and treatment of CVD. The program also recognizes working with community pharmacists and general practitioners as a great opportunity to assess patient risk through tests for high blood pressure and other indicators, including genetic ones. The program offers preventative treatments for individuals identified as high risk.

In addition, the UK Life Sciences Industrial Strategy was established to transform the country's healthcare system to identify disease earlier using risk and stratification, a method of categorizing patients and their needs based current health and other factors. In the last few years, the NHS has accelerated approvals of the most promising new medicines and health technologies, partly by expanding the Accelerated Access Collaborative (AAC), a forum established to encourage UK

---

<sup>41</sup> <https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/cardiovascular-disease/>  
Novartis International AG

health innovation<sup>42</sup>. One goal of the effort is to develop an oligonucleotide manufacturing platform that increases production, reduces cost, and mitigates environmental impact. In January, 2020, Novartis announced it would work with the NHS through a manufacturing consortium to tackle CVD and help the country achieve the goals of the NHS' Long-Term Plan and the Life Sciences Industrial Strategy<sup>43</sup>.

In the United States, the Division of Heart Disease and Stroke Prevention, a part of the Centers for Disease Control and Prevention (CDC), has cooperative agreements in place to help control CVD. These programs seek to prevent, manage, and reduce heart disease and stroke with an emphasis on cutting risk factors, reducing health disparities within state, local, and tribal public health departments, and boosting surveillance and implementation research. As part of the five-year cooperative agreement signed in 2018, health departments will use clinical data to improve adherence to treatment guidelines, increasing engagement in self-management and lifestyle changes of patients with hypertension and hypercholesterolemia<sup>44</sup>. In 2018, CDC funded state and local health departments to design, test, and evaluate innovative approaches to address the disease burden of diabetes, heart disease, and stroke. The efforts focus on developing new ways to identify patients with high

---

<sup>42</sup> Life Sciences Industrial Strategy Update ([publishing.service.gov.uk](https://publishing.service.gov.uk))

<sup>43</sup> Media Release, Novartis announces intent to collaborate with NHS England to tackle burden of cardiovascular disease in the UK January 13, 2020

<sup>44</sup> <https://www.cdc.gov/dhdsp/programs/spha/overview.htm>



blood pressure and high blood cholesterol, develop community programs, expand telehealth, and enhance referral, participation, and adherence of patients in cardiac rehabilitation programs.

## 2.2 Situation in China

### 2.2.1 High numbers of CVD deaths illustrate high disease burden and economic risk

#### *Disease burden*

The Chinese Center for Disease Control and Prevention defines NCDs as those with long duration and slow progression and categorizes four main types: CVD, including heart attack and stroke; diabetes, an independent risk factor for CVD; cancers; and chronic respiratory diseases<sup>45</sup>.

Echoing the global situation, the prevalence and mortality of CVD in China is increasing. According to the Chinese Cardiovascular Association, in 2019 there were about 330 million CVD patients in China or about one-quarter of the country's population. Compared to other diseases, including malignant tumors, CVD is the leading cause of death in China. In 2017, 46% of all deaths in China's rural areas were linked to CVD and about 43% in urban areas<sup>46</sup>.

---

<sup>45</sup> <http://www.chinacdc.cn/jkzt/mxfcrjbhsh/>

<sup>46</sup> Report on Cardiovascular Diseases in China 2019

Among the different types of CVD, atherosclerotic cardiovascular disease (ASCVD), the accumulation of fats, cholesterol, and other substances on artery walls, has been the leading cause of death in China over the past 30 years, with both mortality and incidence increasing (Figures 2a, 2b)<sup>47</sup>.

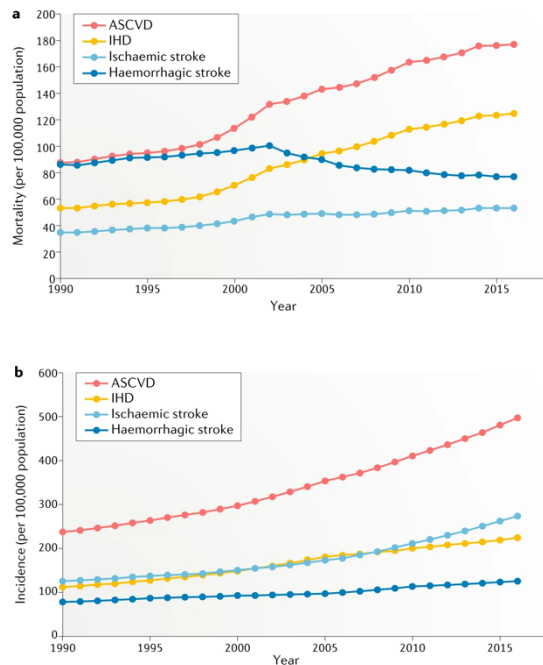


Figure 2: Trends in mortality and incidence of cardiovascular disease in China<sup>6</sup>: a) Mortality from atherosclerotic cardiovascular disease (ASCVD), ischemic heart disease (IHD), ischemic stroke, and hemorrhagic stroke in China. B) Incidence of ASCVD, IHD, ischemic stroke, and hemorrhagic stroke in China. Data were obtained from the open database of the Global Burden of Disease Study in the

<sup>47</sup> Zhao, D., Liu, J., Wang, M. et al. Epidemiology of cardiovascular disease in China: current features and implications. *Nat Rev Cardiol* 16, 203–212 (2019). <https://doi.org/10.1038/s41569-018-0119-4>

Global Health Data Exchange by the Institute of Health Metrics and Evaluation, 2018.

### *Economic and Socioeconomic Burden*

The increasing number of CVD cases leads directly to greater expenditures linked to the diseases. Since 2004, the economic cost of CVD in China has risen, on average, faster than the country's GDP, creating an increased burden on resources. Between 2012 and 2016 alone, medical expenditures for CVD grew from RMB 310 billion to RMB 495 billion, an average of 11% a year<sup>48</sup>. In 2017, the expenditures reached RMB 540 billion and accounted for more than 10% of China's total health expenditures<sup>49</sup> or about 0.7% of GDP. While the proportion of CVD expenditures to total health spending has decreased, the overall spend has increased significantly. Indeed, costs associated with an aging population are growing faster than the economy, causing additional concern. The China Annual Report on Elderly Health of 2018 estimated that between 2015 and 2050 the total social expenditure in China on elderly care, including medical care, welfare, and facilities, will increase from 7% to 26% of GDP<sup>50</sup>. A 2016 study estimated that systematic treatment of patients with hypertension and dyslipidemia in China could generate economic value of

---

<sup>48</sup> Zhang YH. Chai PP. Zhai TM. Wan Q. Research on China CVD Medical Cost Accounting and Prediction. *China Health Economics*. 2019, 38 (5):18-22

<sup>49</sup> Zhang YH. Chai PP. Zhai TM. Wan Q. Accounting and Analysis of China CVD Medical Cost in 2017. *China Health Economics*. 2020, 54 (9):859-865

<sup>50</sup> Annual Report on Elderly Health in China 2018

USD 932 billion over 15 years, from 2016 to 2030, by avoiding millions of CVD deaths<sup>51</sup>.

### 2.2.2 Measures and policies to improve prevention and control of CVD

Since the 1990s, China's central government has explored feasibility models and measures to prevent and control chronic diseases, including a community-level pilot program on chronic disease prevention in 1996 and 34 additional pilots in 1997. A more comprehensive initiative for national prevention and control of chronic diseases began in 2010, integrating CVD, hypertension, and diabetes. These measures recorded a number of successes:

(4) *Risk factor monitoring*. In 2002, China set up a preliminary integrated monitoring system to survey the health of the population across several factors, such as causes of death, number suffering from NCDs and associated risk factors, and nutritional levels<sup>52</sup>. From 2004 to 2018, five monitoring programs were launched nationwide, bringing in a large amount of epidemiologic data, including information on metabolic, environmental, genetic non-modifiable, and readily modifiable risk factors. The modifiable risk factors included, in descending order of relevance to CVD, hypertension, smoking, dyslipidemia

---

<sup>51</sup> Stevens et al. BMC Health Services Research (2016) 16:175

<sup>52</sup> <http://www.nhc.gov.cn/jkj/s7915v/201504/15695dca75d74dc48a7f2b6ded188c63.shtml>

(including high LDL-cholesterol), diabetes, obesity, lack of exercise, and unhealthy diet. These modifiable factors are driving an increase of deaths, morbidity, and costs associated to CVD.

(5) *Health awareness.* As the surveys were conducted, the health awareness of the population also increased. Knowledge of the dangers of hypertension, for example, rose from 30% of the respondents in 2002 to 52% in 2015. The awareness rate of diabetes of those 18 or older increased from 6% in 2002 to 36% in 2013 and of dyslipidemia from 3% in 2002 to 31% in 2010. From 2010 to 2016, the number of patients with standardized management of hypertension more than doubled from 42.2 million to 90.2 million.

(6) *Agencies focusing on CVD.* Agencies were established specifically to guide national NCD control and prevention efforts, including the National Center for Chronic and Non-Communicable Disease Control and Prevention and the National Center for Cardiovascular Disease. About half of the provinces also opened offices dedicated to NCD control and prevention. In addition, medical alliances were formed or expanded and centers opened that focused on specific conditions, for instance chest pain or stroke, together contributing to tiered CVD diagnosis and treatment. Since 2017, the central government has worked to develop medical alliances in local regions to enhance tiered diagnosis and treatment and intensify NCD control and prevention at the primary-care level.

In the *Healthy China 2030* blueprint announced in 2016 and the action plan released in 2019, 15 special actions were delineated, including four directly related to CVD control and prevention. Both the *Healthy China 2030* action plan and the *Medium- and Long-Term Plan for NCD Prevention and Treatment in China* covering 2017 to 2025 set targets for CVD mortality for 2022, 2025 and 2030 (Table 1).

<b>Targets / Year</b>	<b>Premature mortality of the main NCDs</b>	<b>Mortality per 100,000</b>	<b>Standardized management rate of hypertension</b>	<b>Annual blood lipid testing rate for residents over 35</b>
2015 (baseline)	18.5%	238.4	50%	19.4% (2012)
2022	≤15.9%	≤209.7	≥60%	27%
2025	≤14.8%	≤205.1	≥70%	≥30%
2030	≤13%	≤190.7	≥70%	35%
Change by 2030	-30%	-20%	+40%	+80%

Table 1: Key indicators of CVD set by relevant policies (*Healthy China 2030*, *Healthy China 2030* action plan 2019-2030, *Medium- and Long-term Plan for NCD*

## Prevention and Treatment in China)

The action plan also called for implementing chronic disease management at three levels – government, society, and individuals or families – with each level shouldering some responsibility. One report, “Nutrition and Chronic Disease Status of Chinese Residents 2020”, showed that the premature mortality rate caused by four major NCDs decreased from the baseline 18.5% in 2015 to 16.5% in 2019, already almost reaching the 2022 target of 15.9%. Unfortunately, costs and overall deaths linked to CVD continue to rise.

### 2.2.3 The high disease burden of CVD requires greater effort

*Healthy China 2030* and other policy initiatives in China have achieved success in reducing risk factors linked to CVD and increasing public awareness. Despite these achievements, systemic obstacles remain that limit progress in lowering the CVD burden. Three main concerns center on capabilities, implementing preventative measures, and elderly care.

#### *Capability gaps in primary medical institutions*

The *Healthy China 2030* action plan encourages integrated control and prevention of CVD risk factors, including hypertension, high cholesterol, and hyperlipidemia, known collectively as 3H. However, the 3H factors are still treated individually,

often in different hospital departments, with little regard to the connection with CVD. As a result, the impact that doctors have on healthy individuals is limited before a direct CVD diagnosis is made. Furthermore, diagnostic and treatment capabilities at many primary-care facilities are not strong enough to control the 3H factors efficiently, especially in remote and less-developed areas. Delays in diagnoses, inadequate adherence to treatments, and delays in accessing specialized care limit the effectiveness of CVD prevention and management. While the hypertension awareness rate reached 52% in 2015, the control rate of 17% remained relatively low. The control rate for diabetes in 2013, 16%, was also low. Improving capabilities in the healthcare system to prevent, treat, and manage CVD using available treatment guidelines would help reduce mortality rates.

#### *Limited emphasis on implementation of preventative measures*

The *Healthy China 2030* action plan stipulates risk assessment and early intervention for high-risk groups for efficient CVD prevention. In contrast, the healthcare system currently focuses more on those already diagnosed with CVD and is not engaging early or long enough with healthy people or those at risk for CVD, especially those who suffer from hyperlipidemia. For instance, blood lipid tests have become compulsory in physical examinations, assessing levels of triglyceride, total cholesterol, high-density lipid (HLD) cholesterol and LDL cholesterol. However, any abnormalities that are detected fail to get the needed



attention from doctors and patients. As a result, there is often inadequate medical follow-up, which may lead to more severe health issues over time. Similarly, regular screening for diabetes and early medical intervention could help to prevent onset of CVD, a common complication.

*More attention needed in elderly care*

An aging population in China is a clear factor behind the higher incidence of CVD. Between 2000 and 2018, the proportion of China's population of people 60 or older rose from 10% to 18% and the proportion of those 65 or older from 6.8% to 11%<sup>20</sup>. This trend is expected to continue, adding to the country's CVD burden. Research by Wang LM and others<sup>53</sup> concluded that in 2016, 58% of the Chinese 60 years old or older suffered from hypertension, 19% from diabetes, 11% from hypercholesterolemia, and 5% for stroke and 76% of this group suffered from more than one chronic disease. The Chinese Cardiovascular Association estimated in their report of 2018, that even if CVD risk factors remained unchanged, population growth and an aging population would increase the number cardiovascular events, such as angina pectoris, acute myocardial infarction, sudden cardiac death, and stroke, by more than 50% from 2010 to 2030<sup>54</sup>.

---

<sup>53</sup> Study of the prevalence and disease burden of chronic disease in the elderly in China; Wang LM et al; Zhong Hua Liu Xing Bing Xue Za Zhi. 2019 Mar 10; 40(3):277-283. doi: 10.3760/cma.j.issn.0254-6450.2019.03.005 (in Chinese)

<sup>54</sup> Report on Cardiovascular Diseases in China 2018

## 7. Novartis views and proposals

In recent decades, the Chinese government posted remarkable achievements in healthcare. By making health part of the national strategy, the implementation of numerous policies and guidelines paved the way for healthcare system reform. Over the past 10 years, a universal health service system and a health security system have been gradually established and work on disease prevention and control has accelerated at multiple levels of government, all resulting in significant improvement in citizen health and life expectancy. The *Healthy China 2030* framework was established to improve managed care, strengthen the early response system to health threats, and prevent disease. The framework contains special regulations to achieve comprehensive management of disease, establish a tiered diagnosis scheme, and advance medical alliances for capability building and scientific exchange. Nationwide monitoring has been conducted to detect risk factors and provide data-based evidence for treatment.

However, because of an aging of the population and the increasing medical, societal, and economic burden of CVD in China, CVD management encounters several challenges from a long-term perspective. To better meet the CVD prevention and control demands, Novartis' proposal to the Chinese government, as follows, presents initiatives for the short-term and longer term to address the CVD burden in China:

- (4) Establish policies with key performance indicators (KPIs) to effectively address the CVD burden.
- (5) Explore innovative partnership models to improve CVD management.
- (6) Elevate CVD management capabilities at the primary care level.

#### 7.1 Establish policies with key performance indicators (KPIs) to effectively address CVD burden

The Chinese government's early and strong actions taken during the Covid-19 pandemic were central to bringing the outbreak under control. Novartis believes a similarly concerted government approach would be needed to address the medical and economic burden caused by CVD. In 2016, President Xi Jinping announced the application of the "Health in All Policies" (HiAP) approach to public policies across sectors. Under the concept<sup>55</sup>, which reflects the WHO's promotion of intersectoral action for health in 1978, HiAP systematically takes into account the health and health-system implications of decisions, seeks synergies, and avoids harmful health impacts to improve population health and health equity. In addition, it strives to improve the accountability of policy makers for health impacts at all levels of government.

---

<sup>55</sup> [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/188809/Health-in-All-Policies-final.pdf](https://www.euro.who.int/__data/assets/pdf_file/0007/188809/Health-in-All-Policies-final.pdf)  
Novartis International AG

In line with the HiAP approach, *Healthy China 2030* defines health responsibilities at three levels –government, society, and individuals or families – for taking actions that contribute to synergies in addressing needs related to NCDs, including CVD. With regard to CVD, related indicators and comprehensive management of hypertension, hyperlipidemia, and diabetes as medical risk factors of CVD had already been included in *Healthy China 2030*. However, there is a lack of clarity about the implementation of an action plan in line with the policies and work sharing among different healthcare stakeholders. To bridge this gap, special leadership of the central government is required similar to the strong management shown in the context of the Covid-19 pandemic.

Therefore, Novartis supports establishment of a detailed work plan to implement holistic CVD treatment and prevention with defined key performance indicators (KPIs) for each stakeholder group. These KPIs should refer to executable and measurable targets to ensure CVD prevention and control. For example, improving the blood lipid testing rate has been included in *Healthy China 2030* (Table 1) as one measure. Based on the existing knowledge of risk factors, policies need to further specify blood lipid testing by inclusion of different lipid sub-types, such as tri-glyceride, total cholesterol, HLD cholesterol, and LDL cholesterol. KPIs should also be applied in the area of implementation of treatment guidelines, medical institution investment in qualification of personnel and equipment, citizen

involvement, and, ultimately, success in achieving health targets. Since the elderly are especially prone to suffer from CDV, KPIs that monitor strengthening health management for NCD and CVD within this group are vital.

Novartis believes that implementation of KPIs on all government levels would support the execution and accelerate the achievement of the *Healthy China 2030* goals.

### 3.2 Explore innovative partnership models to improve CVD management

Efforts by the Chinese government to lower the human and economic burden of CVD have helped to increase awareness of hypertension and diabetes. However, morbidity and mortality continue to increase due to the aging population and some structural limitations as outlined earlier.

Most CVD conditions are preventable, and Novartis is offering to work with the Chinese government to explore options of a new type of partnership among different stakeholders using a systems-thinking approach that goes beyond conventional healthcare boundaries and practices. We believe a wider range of stakeholders including companies outside the traditional healthcare sector could help in identifying the best incentives for behavioral change toward higher engagement from citizens in their own health.

This partnership should enable full-scale prevention of CVD as we work toward

shared goals that proactively identify risk factors, apply differentiated prevention programs on diverse population groups, and avoid risks through the introduction of new technologies for screening and diagnosing CVD. Such a partnership would foster more comprehensive management of CVD and relevant chronic diseases, like diabetes, hypertension, and hyperlipidemia, which are already targeted in the *Healthy China 2030* action plan. It would also accelerate patient access to potentially transformative therapies and improved health outcomes, giving hope to millions of CVD patients and, ultimately, reducing the economic burden on the healthcare system through avoided cardiovascular events and associated hospital admissions.

Novartis believes such a new partnership among government, industry, and others would improve and accelerate long-term CVD control and economic growth, fulfilling central objectives laid out in the *Healthy China 2030* action plan.

### 3.3 Elevate CVD management capabilities at primary care level

Novartis welcomes the attention given by the Chinese government to primary care, as shown through various healthcare reform measures including the establishment of a tiered diagnosis scheme designed to deal with most NCDs at primary care centers. As CVD incidence and mortality rates are higher in rural areas than in urban areas, special attention and more investment may be needed in rural primary care facilities. This proposal aligns with the *Rural Vitalization Strategy*, a development

blueprint that intends to improve, among other aspects, health management in village clinics and county-level hospitals to serve the health needs of different populations, including the elderly<sup>56</sup>.

As primary care facilities play a critical role in the CVD control and prevention, Novartis believes they should be a focus of our proposed partnership. Primary care could, for instance, benefit from a systematic training curriculum that includes current treatment guidelines, lessons on standards of care for NCDs and CVD, general elderly care, and a better understanding of behavioral and other risk factors connected to comorbidities in CVD patients. Also, medical infrastructure, such as equipment for screening, imaging technologies, and high-quality drug supply, should be guaranteed for optimal diagnosis and treatment.

Partnership programs could help to develop a system that connects medical resources, enables an exchange of healthcare personnel, and supports alliances among different hospitals and treatment centers. Alliances among different centers and hospitals, especially with lower-tier hospitals, would raise diagnostic and treatment standards and increase awareness and adherence to national CVD treatment guidelines. The programs could be complemented by advanced digital tools, including Internet hospitals and telemedicine, online pharmacies, and artificial intelligence technologies, that can help to improve diagnoses,

---

<sup>56</sup> [http://www.gov.cn/zhengce/2021-02/21/content\\_5588098.htm](http://www.gov.cn/zhengce/2021-02/21/content_5588098.htm)  
Novartis International AG

identification of risk factors, and treatment compliance.

China achieved its goals for alleviating poverty set in the 13<sup>th</sup> Five-Year-Plan, ending in 2020, and the lives of those under its mandate improved greatly, including their health. Because of the long-term medical burden and economic impact presented by CVD, Novartis suggests including CVD management as a measure for targeted health-related poverty alleviation in the future, covering the reduction of individuals' risk factors, investment in infrastructure, and improved capabilities of health workers.

In the long-term, enhancing capacities and capabilities in rural primary care in the area of CVD would help to reduce the disease burden, prevent health-related poverty, and support achieving *Healthy China 2030* targets.

## **8. Conclusion**

Novartis is committed to delivering science-based medical innovation and welcomes the Chinese government's ongoing efforts in healthcare. We are committed to offering innovative solutions and partnerships that could be valuable in achieving the goals of *Healthy China 2030*.

As CVD is the single leading cause of death globally and in China and the incidence of CVD in China is steadily increasing, we propose that the Chinese government engage in innovative partnerships that focus on the establishment of a



comprehensive management system that addresses multiple CVD risk factors through prevention and treatment. Novartis believes that the great societal and economic burden brought by CVD can only be successfully addressed by partnerships among the government, industry, and other stakeholders. Novartis remains committed to collaborate with the Chinese government and to find new approaches to improve and accelerate long-term CVD control and boost economic growth, fulfilling central objectives laid out in the *Healthy China 2030* action plan.