



# São Paulo call to action for the prevention and control of high blood pressure: 2020

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The findings and conclusions of this report are those of the authors and do not necessarily represent the official position of the World Health Organization, or the Pan American Health Organization.

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## 1 | INTRODUCTION

### 1.1 | Prevalence of high blood pressure

- Between 1.13 and 1.4 billion people had hypertension in 2010 (defined as >140/90 mm Hg. <https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019).<sup>1</sup>
- Blood pressure increases with age in industrialized societies such that an estimated 9 in 10 adults living to 80 years of age will develop hypertension.<sup>2</sup>
- Approximately 1 in 4 adults have hypertension ( $\geq 140/90$  mm Hg) including 40% of those over age 25 years (<https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019; <https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019).<sup>1,3</sup>
- A definition for hypertension of >130/80 mm Hg increases the prevalence of hypertension approximately 1.5-fold to about 50% of adults.<sup>4,5</sup>

### 1.2 | Health impact of high blood pressure

- Increased blood pressure is the world's leading single preventable risk factor for death and 3<sup>rd</sup> leading risk for disability according to the Global Burden of Disease Study.<sup>6</sup>
- Increased blood pressure caused an estimated 10.4 million deaths (almost 19% of overall deaths) and 218 million disability-adjusted life years (8.7% of total DALYs) in 2017.<sup>6</sup>
- About 70% of deaths related to increased blood pressure occur in people with blood pressure >140/90 mm Hg, with the remaining 30% occurring in people with suboptimal blood pressure, that is, <140/90 mm Hg.<sup>7</sup>
- Over 50% of heart disease, stroke, and heart failure are caused by increased blood pressure.<sup>7,8</sup>
- Hypertension is the single most important risk factor for ischemic as well as hemorrhagic stroke.<sup>9,10</sup>
- Hypertension causes over 40% of deaths in people with diabetes<sup>11</sup> and is also a leading risk for fetal and maternal death in pregnancy, dementia, and renal failure (particularly in people of African ancestry) and can cause blindness.<sup>7,12-14</sup>

### Key Messages

- About 1/4th of adults have high blood pressure which is the single most important risk for death (including heart disease and stroke).
- There are effective policies that could facilitate people making healthy choices to prevent raised blood pressure, and if fully implemented, could largely prevent hypertension from occurring.
- Hypertension is easy to screen and treat for BUT only about 50% of adults with hypertension are aware of their condition and only about 1 in 7 is adequately treated.
- Preventing and controlling high blood pressure is the major mechanism for NCD prevention and control and a model for other NCD risks.
- Effective lifestyle and drug treatments could prevent and control hypertension in most individuals if systematically applied to the population, simple interventions are feasible in all settings, and can be used to enhance primary care.
- Urgent sustained action is needed is needed for effective public policies and health system changes to prevent and control hypertension.

### 1.3 | Impacts on people living in low-, middle-, and high-income countries

- Hypertension is a leading risk for death in low-, middle-, and high-income countries.<sup>7,15</sup>
- Two-thirds of those living with hypertension are in low- and middle-income countries where most of the world's population lives (<https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019).<sup>1,3</sup>
- The number of adults with hypertension increased from 594 million in 1975 to 1.13 to 1.4 billion in 2010 with most of the increase in low- and middle-income countries (<https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019).

- Systolic blood pressure appears to be increasing over time in east, southeast and south Asia, Oceania and Sub-Saharan Africa while decreasing in other regions.<sup>15</sup>
- Heart disease and stroke occur in younger people in low- and middle-income countries.<sup>1,3</sup>

## 1.4 | Economic impact of high blood pressure

- An estimated 10% of global health care spending is directly related to raised blood pressure and its complications such as ischemic heart disease, heart failure, and stroke.<sup>16</sup>
- Nearly 25% of health care spending in Eastern Europe and Central Asia is due to blood pressure-related disease.<sup>16</sup>
- The Noncommunicable Disease (NCD) Global Business Plan estimates clinical management of cardiovascular risks that includes hypertension to have a return on investment of over USD \$3 for every USD \$1.<sup>17</sup>

## 2 | DETERMINANTS OF HIGH BLOOD PRESSURE

### 2.1 | Unhealthy environments play a major role in increasing blood pressure

- Unhealthy environments are a major contributor to unhealthy lifestyles and behaviors.
- There is wide national variation in the prevalence of risks for developing hypertension (eg dietary risks, physical inactivity, obesity, excess alcohol consumption) that are likely to be major determinants of differing prevalence rates of hypertension.<sup>6</sup>
- Unhealthy diet (excluding the dietary impact on obesity) contributes to about half of the number of patients with hypertension.<sup>18</sup>
- About 30% of hypertension is related to increased sodium (salt) consumption, and about 20% related to low dietary potassium (low fruit and vegetable intake).<sup>18,19</sup>
- A high ratio of saturated fats to polyunsaturated fatty acids also contributes to hypertension.<sup>20</sup>
- Physical inactivity is related to about 20% of hypertension.<sup>18</sup>
- Obesity is associated with about 30% of hypertension.<sup>18</sup>
- Excess alcohol consumption also increases blood pressure and causes hypertension.<sup>18</sup>
- Being tobacco-free is especially important for people with hypertension to prevent cardiovascular and other noncommunicable diseases.<sup>3</sup>
- Disparity in education and socioeconomic status has a significant impact on the prevalence and control of hypertension.<sup>21-23</sup>
- Governments have endorsed nine global voluntary targets with the overarching aim to reduce premature death from the four major NCDs by 25% by 2025. Targets related to hypertension and

risk factors include a 2025 goal of reducing uncontrolled blood pressure 25%, reducing dietary sodium 30%, reducing insufficient physical activity 10%, a 30% reduction in tobacco use in those age 15 years or over, and a halt to the rise in obesity and diabetes.<sup>24</sup>

### 2.2 | Clinical interventions to control hypertension have not been systematically applied in most countries

- Worldwide, about half of adults with hypertension are unaware that their blood pressure is high, a situation more dire in low-income countries.<sup>1,25</sup>
- Some of those who are aware that their blood pressure is high remain untreated. Even when treated, most have sub-optimally controlled blood pressure.<sup>1</sup>
- In high-income countries, the average rates of awareness, treatment, and control are 67%, 55.6%, and 28.4%, respectively, while in low- to middle-income countries the rates are 37.9%, 29%, and 7.7%, respectively.<sup>1,26</sup>
- Fewer than 1 in 5 adults with hypertension are under control globally and fewer than 1 in 14 in Sub-Saharan Africa (<https://www.who.int/news-room/fact-sheets/detail/hypertension>, accessed June 16, 2019).<sup>27</sup>

## 3 | WHAT WORKS?

### 3.1 | Investments in prevention are often cost-saving

- Policy interventions at a population level to create environments that improve diet and physical activity are often cost-saving and facilitate people making healthy choices.<sup>28,29</sup>
- Reducing dietary sodium is estimated to have a return on investment of \$13 to \$18 for every dollar invested.<sup>17,30</sup>
- Recommended policies to prevent or manage NCDs including hypertension are through improved diet, increased physical activity, avoidance of tobacco, and reducing the harmful use of alcohol and are outlined by the World Health Organization.<sup>31,32</sup> (<https://www.who.int/tobacco/mpower/publications/en/>, accessed May 7, 2019).

### 3.2 | Investments in treatment and control are cost-effective

- Effective treatment of blood pressure >140/90 mm Hg reduces stroke and heart disease.<sup>34</sup>

- Effective treatment of blood pressure >130/80 mm Hg reduces stroke and heart disease in those at moderate-to-high cardiovascular risk (>10%-19% risk of developing cardiovascular disease in the next 10 years for moderate and >20% risk of developing cardiovascular disease in the next 10 years for high risk).<sup>34</sup>
- In the United States, Canada, and Finland, over 80% of people with hypertension have other cardiovascular risks and/or evidence of blood pressure-related damage (heart disease, stroke, and/or kidney damage).<sup>35,36</sup>
- Objective assessment of absolute cardiovascular risk can be helpful in the overall management of patients including the potential need for lower blood pressure treatment and target thresholds, and for treatment of dyslipidemia.<sup>34,37-39</sup>
- Treatment of hypertension is the cornerstone of routine NCD primary prevention providing a rationale for regularly screening blood pressure in all adults and treating those with hypertension.
- The SPRINT trial results and a new analysis of the ACCORD Trial emphasize that, in general, intensive blood pressure treatment is beneficial in reducing mortality in people at high cardiovascular disease risk, though intensive blood pressure treatment may lead to additional side effects.<sup>40,41</sup>

## 4 | WHAT ARE THE BARRIERS?

### 4.1 | Policy inertia

- Many countries have not implemented comprehensive effective public policies that would result in optimum diets and physical activity, alcohol, and tobacco control and would prevent much non-communicable disease including risks like hypertension<sup>33</sup> (<https://www.wcrf.org/int/policy/nourishing-database>, accessed April 17, 2019, <https://www.who.int/news-room/fact-sheets/detail/physical-activity>, accessed May 5, 2019, [https://www.who.int/substance\\_abuse/activities/fadab/msb\\_adab\\_gas\\_progress\\_report.pdf?ua=1](https://www.who.int/substance_abuse/activities/fadab/msb_adab_gas_progress_report.pdf?ua=1), accessed May 5, 2019).
- Many countries have not scaled up primary care to address population health needs including the diagnosis and management of hypertension.<sup>42,43</sup>
- Many national hypertension, and cardiovascular organizations and societies do not have published strategic plans for preventing, diagnosing, treating, and controlling hypertension and do not effectively advocate for policies aligned with those developed by the WHO for the effective prevention and control of NCDs including hypertension.

### 4.2 | Health systems inertia

- Although improvement in hypertension control is one of the most effective and cost-effective clinical interventions to reduce the

burden of noncommunicable diseases and meet sustainable development goals (SDG), in many countries the prevention and control of hypertension is not a top political and health priority.<sup>44</sup> Most countries do not have a strategic public health/ health systems approach to controlling hypertension.<sup>45</sup>

- A strategic public health/ health systems approach to controlling hypertension includes coverage of the full population for; easy access to a reliable, affordable supply of a high-quality core set of antihypertensive medications including single-pill combinations, easily accessed team-based care, systematic measurement/evaluation of blood pressure at all clinical visits, community-based screening for hypertension that is closely linked to the health system, use of validated electronic blood pressure monitors by recently trained staff, use of a simple directive diagnostic and therapeutic treatment algorithm, use of a hypertension registry with performance reporting, and regular (3-5 year) population hypertension surveys.<sup>46-52</sup>
- Many clinicians do not initiate or adequately titrate treatment in those with elevated blood pressure readings.<sup>53,54</sup>

## 5 | A TRANSFORMATION AGENDA FOR PREVENTION AND CONTROL OF HIGH BLOOD PRESSURE

- Transformative health service policies and interventions can enhance primary healthcare services and hypertension control and are highly recommended by the World Health Organization, Resolve to Save Lives, the International Society of Hypertension, the World Hypertension League, and other organizations.
- The World Health Organization has led multiple international organizations in developing state of the art resources that outline policies and interventions for prevention and control of cardiovascular diseases and diabetes. The most prominent and up-dated is the HEARTS technical package ([https://www.who.int/cardiovascular\\_diseases/hearts/en/](https://www.who.int/cardiovascular_diseases/hearts/en/), accessed April 17, 2019).
- Resolve to Save Lives (RTSL), an initiative of Vital Strategies, is a philanthropically funded global program to enhance hypertension control, reduce dietary sodium, eliminate artificial dietary trans fats, and improve pandemic preparedness (<https://www.resolvevetosavelives.org/>, accessed April 17, 2019).
- For hypertension control, the HEARTS technical package strongly advocate increasing primary care clinical capacity by team-based care, reliable affordable supply of quality antihypertensive medication (including single-pill combinations where appropriate), systematic measurement/evaluation of blood pressure at all clinical visits, use of validated electronic blood pressure monitors by recently trained staff, use of a simple directive diagnostic and therapeutic treatment algorithm, use of a hypertension registry with performance reporting, and regular population hypertension surveys.
- The International Hypertension Society with partner organizations

annually hosts May Measurement Month to screen blood pressure using standardized techniques and increases awareness of hypertension, while the World Hypertension League with partner organizations annually hosts World Hypertension Day (May 17, 2017) to increase hypertension awareness.<sup>25,55-57</sup>

## 6 | A TRANSFORMATIVE CLINICAL APPROACH

### 6.1 | Healthcare professionals and healthcare facilities and organizations

- Stay up to date with global best standards in hypertension prevention and control.
- Measure blood pressure at all relevant clinical encounters.
- Promote, procure, and enforce the use of automated blood pressure devices that have been validated to be accurate in assessing blood pressure.
- Develop standardized training programs on accurate measurement of blood pressure for patients and healthcare professionals.
- Ensure the staff measuring blood pressure has been regularly trained and evaluated to ensure accurate blood pressure readings. Require certification courses where available.
- Assess cardiovascular risk using an objective method (computer program and risk table) and the presence of cardiovascular disease or hypertension-related target organ damage (eg chronic kidney disease) in those diagnosed with hypertension. Manage all identified cardiovascular risks by nationally or internationally recognized standards.<sup>58,59</sup>
- Team-based care improves hypertension treatment and control.<sup>34,60</sup> Optimize patient-centered care using a team-based approach to measure blood pressure, regularly contact the patient and perform other routine tasks within the regulatory scope of practice. In addition to using a team-based approach, with non-physician professionals (clinic office workers, nurses, pharmacists, community health workers etc) practicing at the top of their license/authority, office staff, spouses, and friends can play an important role in improving the effectiveness of treatment. However, the patient must always remain at the center of the team.
- Assess each patient for suitability to be diagnosed and treated using a simple hypertension management algorithm/protocol and individualize management for the small proportion of patients unsuited to the algorithm or who develop side effects or drug intolerance.<sup>61</sup>
- Treat people with blood pressure of 160/100 mm Hg and above immediately on diagnosis with both lifestyle change and antihypertensive drug therapy.
- Demand the use of high-quality antihypertensive medications with emphasis on those that meet acceptable standards of quality, are long-acting, can be used once a day and are consistently

available so as to avoid the confusion and discontinuation of therapy that occurs when drugs (even when clinically equivalent) are interchanged.

- Regularly assess patient adherence to hypertension management.
- Use registries with performance reporting.
- Assess for diet, tobacco use, alcohol use, physical activity, and obesity and provide individualized lifestyle advice. Specifically, advise and assist all tobacco users to stop and advise and assist all heavy alcohol consumers to limit intake or stop.
- Encourage and assist community blood pressure screening programs, such as May Measurement Month and World Hypertension Day (May 17).
- Educate patients, patient families, and the public.

### 6.2 | Primary care

- Ensure organizations that represent primary healthcare providers who prevent, diagnose, and manage hypertension are central in strategies to control hypertension.
- With primary care organizations, ensure there are primary care hypertension management guidelines adapted to the country's population. Translate the guidelines into simple, easy to use diagnostic, and therapeutic algorithms/protocols that include single-pill combination drugs.<sup>46,61,62</sup>
- With primary care organizations develop standardized education programs that focus on the key interventions to systematically manage and control hypertension in primary care.<sup>63</sup>
- Where feasible, use progress in technology (digital-health and mobile-health systems) to engage and empower patients.<sup>64-66</sup>
- Home BP monitoring combined with the use of telemetry for transmission of recorded home values to the healthcare profession and feedback guidance from the healthcare professional aids optimizing therapy, enhancing patient adherence, and reducing therapeutic inertia.
- Smartphones with hypertension management-related applications can provide lower-cost telemedicine resources for daily practice. A smartphone application from the European Society of Hypertension (ESH CARE app) has been validated and continuously updated.<sup>65,67-69</sup>

### 6.3 | Recognize and reward

- Nominate deserving programs, program representatives, and individuals for World Hypertension League and International Society of Hypertension recognition awards for population sodium reduction and for blood pressure control (<http://www.whleague.org/index.php/news-awards-recognition>, accessed April 17, 2019; <http://ish-world.com/activities/awards-prizes.htm>, accessed May 5, 2019).

## 6.4 | Advocacy

- Advocate for healthy public policies; especially, those that reduce dietary sodium, promote healthy diets, physical activity, reduce harmful alcohol consumption, and eliminate tobacco use and artificial trans fat.<sup>31</sup>
- Advocate for/encourage the updating of national drug formularies to ensure the availability and affordability of high-quality antihypertensive medications with emphasis on long-acting and single-pill combination medicines.
- Advocate for policies including regulation to ensure the procurement, sale, and use of validated accurate and appropriate automated blood pressure devices and cuffs.<sup>70,71</sup>
- Advocate for regular training and certification for healthcare professionals and laypeople who regularly assess blood pressure.<sup>72</sup>
- Advocate for team-based collaborative patient-centered primary care.<sup>50</sup>
- Advocate for the use of hypertension registries for clinical follow-up and performance feedback in clinics that care for people with hypertension.<sup>49,73,74</sup>
- Advocate for standardized monitoring and evaluation of efforts to prevent and control hypertension.<sup>49,74-76</sup>
- Track regular (quarterly or annual) reports of hypertension control rates in the country and advocate for and support efforts to improve these rates.

## 6.5 | Empowered Individuals

- Base your diet mainly on a variety of vegetables (especially green leafy vegetables), fruits, nuts, seeds, and legumes.<sup>77</sup>
- Eat unprocessed or minimally processed foods most often.
- Choose low sodium options and do not add salt to food.
- Be tobacco-free.
- Be physically active.
- Attain and maintain a healthy body weight.
- Limit alcohol consumption and avoid exceeding the recommendations for maximum daily and weekly alcohol intake.
- Get blood pressure checked regularly and understand what it should be.
- Measure your own blood pressure. Learn how to obtain accurate BP measurements and how to use them, in partnership with your healthcare team.
- Advocate for healthy public policies.
- Demand the use of high-quality antihypertensive medications with emphasis on those that are long-acting.
- Connect with your healthcare provider through digital-health and mobile-health validated tools.
- When prescribed medications for hypertension treatment, take them regularly until changed by a healthcare professional. Build a routine for medication taking and monitor your pill taking to ensure adherence.

## 7 | GLOBAL BEST PRACTICE RESOURCES

- Resources for enhancing hypertension control from WHO and RTSL can be found in the Knowledge Action Portal, noncommunicable disease (<https://www.knowledge-action-portal.com/> accessed April 17, 2019), and the LINKS Global Community for Cardiovascular Health (<https://www.linkscommunity.org/> accessed April 17, 2019) and at [https://www.who.int/cardiovascular\\_diseases/hearts/en/](https://www.who.int/cardiovascular_diseases/hearts/en/), (accessed June 3, 2019).
- Educational and training resources on hypertension prevention and management are also available at the Pan American Health Organization website ([https://www.paho.org/hq/index.php?option=com\\_content&view=article&xml:id=15056:hearts-in-the-americas&Itemxml:id=3465&xml:lang=en](https://www.paho.org/hq/index.php?option=com_content&view=article&xml:id=15056:hearts-in-the-americas&Itemxml:id=3465&xml:lang=en), accessed June 3, 2019) and virtual campus for Public Health (<https://mooc.campusvirtualsp.org/enrol/index.php?xml:id=35>, accessed May 6, 2019).
- World Hypertension League resources can be found at <http://www.whleague.org/> (accessed May 6, 2019).
- International Hypertension Society resources can be found at <http://ish-world.com/index.htm>. (accessed May 6, 2019).

This fact sheet and call to action is supported by the World Hypertension League, Argentinian Society of Hypertension, Asia-Pacific Regional Office of the World Hypertension League, South Asian Regional Office of the World Hypertension League, African Research Universities Alliance, Belgian Hypertension Committee, Blue Cross and Blue Shield of Louisiana, Brazilian Hypertension Society, Bulgarian Hypertension League, Caja Costarricense de Seguro Social (Costa Rican Social Security Fund), Cameroon Heart Foundation, Chinese Hypertension League, Colleagues In Care, Hypertension Canada, European Society of Hypertension, European Society of Cardiology Council on Hypertension, Ibadan Center of Excellence for Non-communicable Diseases, Indian Society of Hypertension, International Council of Cardiovascular Prevention and Rehabilitation, International Society of Hypertension, International Society for the Study of Hypertension in Pregnancy, International Society of Nephrology, Iranian Heart Foundation, Lancet Commission on Hypertension Group, Latin American Society of Nephrology and Hypertension, Latvian Society of Hypertension and Atherosclerosis, Mongolian Society of Hypertension, National Technical Advisory Committee of the Arterial Hypertension Program of Cuba (Ministry of Public Health), NHMRC Centre of Research Excellence in Cardiovascular Outcomes Improvement (Australia), Onom Foundation (Mongolia), Philippine Society of Hypertension, Resolve to Save Lives, Saudi Hypertension Management Society, Sociedade Portuguesa de Hipertensão, South Asia Regional Office of the World Hypertension League, Stroke Control Innovations Initiative of Nigeria, Stroke Investigative Research and Educational Network (SIREN), Sudanese Society of Hypertension, Swedish Society for Hypertension, Stroke and Vascular Medicine, Stroke Association Support Network-Ghana, Taiwan Hypertension Society, Taiwan Society of Cardiology, Thai Hypertension Society,

University of São Paulo at Ribeirão Preto College of Nursing, World Hypertension Action Group, World Health Summit, World Stroke Organization.

### CONFLICT OF INTEREST

NRCC was a paid consultant to the Novartis Foundation (2016-2017) to support their program to improve hypertension control in low- to middle-income countries, which includes travel support for site visits and a contract to develop a survey. NRCC has provided paid consultative advice on accurate blood pressure assessment to Midway Corporation (2017) and is an unpaid member of World Action on Salt and Health (WASH). AES received speaker fees from Novartis and Omron for scientific lectures on blood pressure and risk assessment, and Servier for presenting on raising awareness of blood pressure measurement. She is a paid consultant to Abbott Pharmaceuticals on antihypertensive medication and is President of the International Society of Hypertension. MAW has served as a consultant to AbbVie and Bristol Myers Squibb on drug safety and has received travel funds from Omron. He is a member of advisory boards of Medtronic, ReCor, and Ablative Solutions. MO reports honoraria for talks from Glaxo Smith Kline (GSK) and Takeda Inc GP reports honoraria from Omron Health Care, Sanofi, and Servier. AR reports conference support by Servier. PW, LAB, PO, XHZ, CV, TK, DL, MJ, AM, FLP, MB, EB, and JS do not have any financial conflicts of interest to declare.

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**How to cite this article:** Campbell NRC, Schutte AE, Varghese CV, et al. São Paulo call to action for the prevention and control of high blood pressure: 2020. *J Clin Hypertens*. 2019;21:1744-1752. <https://doi.org/10.1111/jch.13741>