

Cardiovascular Health in the Americas: Facts, Priorities and the UN High-Level Meeting on Non-Communicable Diseases

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SUMMARY

Population aging, smoking, unhealthy diet and physical inactivity, in the context of globalization and unregulated urbanization, explain the high prevalences of hypertension, hypercholesterolemia and diabetes in the Americas, making cardiovascular diseases the main cause of death. Moreover, cardiovascular diseases and their risk factors disproportionately affect the poorest people, obstructing antipoverty efforts and further deepening health and other inequities. The global crisis of chronic non-communicable diseases has reached such proportions that the UN General Assembly called a high-level meeting in September 2011 to address the issue as one of human development, aiming to stimulate political commitment to a concerted global effort to stem the pandemic. In reference to the Americas, this article reviews the burden of cardiovascular diseases and describes priorities for strategies and action in the region and their relation to the results of the UN meeting.

Cardiovascular Diseases in the Americas

As elsewhere in the world, chronic non-communicable diseases (NCD) are rampant in the Americas. Population aging, smoking, unhealthy diet and physical inactivity, in the context of globalization and unregulated urbanization, explain the high prevalences of hypertension, hypercholesterolemia and diabetes in the region, making cardiovascular diseases (CVD) the main cause of death.[1,2] Recent studies in seven Latin American countries found prevalences in adults of 18% for hypertension, 14% for high cholesterol, 7% for diabetes, 23% for obesity and 30% for smoking.[3] Given the region's epidemiologic profile, risk of a cardiovascular event in the next ten years is high in the adult population aged <70 years: up to 41% in men and 18% in women in countries with very low infant and adult mortality (such as Canada, Cuba and the United States); up to 25% and 17% in men and women respectively, in countries with low infant and adult mortality (such as Argentina, Barbados and Chile) and up to 8% and 6% in men and women respectively, in countries with very high infant and adult mortality (such as Bolivia and Ecuador).[4]

In the Americas in 2007, circulatory diseases (ICD-10, I00-I99) were responsible for approximately 30% of deaths from all causes: 1,498,645 deaths. Four conditions were responsible for 87% of these: ischemic heart disease (IHD) (ICD-10, I20-I25), cerebrovascular disease (ICD-10, I60-I69), cardiac insufficiency (ICD-10, I50) and hypertension (ICD-10, I10-I15).[5]

IHD was the leading cause of death for both sexes, with 662,011 deaths (362,596 men and 299,415 women), making up 13% of all deaths in the Americas; and it was the first or second cause of death in 30 countries, with mortality rates substantially higher in men than women. There were notable differences among countries, with age- and sex-adjusted mortality rates from 34

to 129 per 100,000 population. Cuba reported IHD mortality rates of 112 and 86 per 100,000 population in men and women respectively.[5]

In Latin America and the Caribbean, a substantial proportion of IHD deaths occur prematurely—more so in men than women—at the time of their greatest economic and social contribution. Cuba's IHD mortality rates in the population aged <70 years are 1.5 to 2.5 times those of Canada, which had rates of 32 and 9 per 100,000 population in men and women respectively.[5]

In the Americas, cerebrovascular disease was responsible for 336,809 deaths (153,120 men and 183,689 women) in 2007, making it the second cause of death in both sexes, with nearly 7% of all deaths in the region. It was between the first and third cause of death in at least 12 countries. Panama, Venezuela, Cuba and Paraguay reported the highest mortality rates: 49–61 per 100,000 population in both sexes. Canada reported the lowest at 9 and 10 per 100,000 population in men and women, respectively, contrasting especially with countries having a similar overall mortality profile.[5] In connection with this phenomenon, a non-linear inverse relationship has been observed between the proportion of premature mortality due to cerebrovascular diseases and purchasing-power adjusted Gross National Product.[6] CVDs and their risk factors disproportionately affect the poorest population sectors,[7] plus family and government budgets because of treatment costs and potential years of life and productivity lost to premature death and disability.[8,9] These diseases obstruct antipoverty efforts and further deepen health and other inequities.[7]

CVD Priorities for the Americas

Accordingly, in 2010 PAHO sponsored a regional consultation to marshal the best available scientific evidence to prioritize CVD control actions in the Americas, applying criteria of cost-effectiveness, social value and equity.[10] The consultation involved a wide range of experts, institutions, civil society organizations and ministries of health, as well as PAHO technical personnel. Experts presented their recommendations based on assembled evidence to panels assigned four specific arenas for action: public policy and population-level prevention; risk reduction and high-risk management strategies; management of acute coronary syndrome and stroke; and organization of health system response, including emergency services. Each panel refined its draft document through reiterative exchanges, then met to collectively assess their recommendations, evidence and rationales and write a draft consensus statement with recommendations for health decision makers. This was circulated among participants until final consensus was reached on each priority's formulation and justification.

The consultation focused its activities on CVDs of atherosclerotic origin and their major risk factors. Priorities were aligned with the four action areas of the Regional Strategy and Plan of Action on an Integrated Approach to the Prevention and Con-

trol of Chronic Diseases, adopted by PAHO member states in 2006: public policy and advocacy, health promotion and disease prevention, integrated control of NCDs and their risk factors, and surveillance.[11]

Public policy and advocacy There is evidence that lack of coordination in CVD prevention and control leads to both gaps and overlaps; hence, addressing these diseases and their risk factors demands involvement by all government agencies and society, not just the health system.[12] In view of this, and for health to be considered in all policies,[13,14] top priority was given to high-level multisectoral coordination mechanisms for population-level prevention, not only for CVDs but for all NCDs.

Similarly, since CVDs and their risk factors are both causes and consequences of poverty, the consultation urged that an explicit goal of prevention and control plans be reducing inequitable distribution of risk and disease burden, as well as ensuring more equitable implementation of prevention and control activities. There is a strong inverse relationship between socioeconomic status and CVD risk, so reducing disparities in CVD burden also requires action to limit factors that increase population inequalities.[15]

Networking was also identified as a priority. Networks help disseminate lessons learned, improve communication and coordination between countries, standardize evaluation approaches, support adoption of best practices and better resource allocation, stimulate innovation, strengthen relationships, and promote coordination of nutrition, trade, fiscal and health policies.

Throughout the Americas, noticeable differences by population group were observed in both risk factor and disease prevalence, as well as in access to health services.[16] The health systems that best support improvements in population health have universal coverage, coordinate primary health care appropriately with the rest of the health system, mobilize primary health care to act on a range of social determinants, and balance prevention and promotion activities with curative ones.[17,18] Hence, the consultation emphasized the need to move toward universal health coverage and equitable access to health services. Health promotion, disease prevention and efficient and high-quality treatment are integral to the right to health, and countries were urged to include all these in existing publicly-funded programs.

CVDs have a greater impact on low- and middle-income populations, and in some countries patients pay up to 78% of medication costs out of pocket.[19] These realities hinder efforts to fight poverty, so the consultation identified as a priority ensuring access to medications and other essential technologies, including laboratory tests, particularly for disadvantaged groups.

Health promotion and disease prevention In this action area, the regional strategy defined five priorities related to tobacco, salt, healthy eating, physical activity and alcohol (Table 1).

Integrated control of NCDs and their risk factors Provision of efficient and sustainable health services requires sufficient numbers of well-trained health workers. Implementation of integrated risk and NCD prevention and control models requires priority attention in such areas as: revised and updated health sciences curricula, including continuing education and accreditation; information and communications technologies;

evidence-based medicine; planning; health services administration; and clinical management.[29] Accordingly, the consultation gave priority to developing comprehensive and sustainable strategies for continuing education, especially for primary health care workers, to strengthen NCD prevention and control—if necessary, transforming academic programs in order to do so.

It is well established that fragmentation of clinical care leads to non-compliance with international standards and hence, suboptimal care and more relapses and complications.[30] This factor prompted the consultation to prioritize strengthening health systems based on primary health care organized in integrated service networks, with special attention to the three basic primary care functions in relation to NCDs: system gatekeeping, coordination and continuity of care, and integration of user information.

Appropriate network integration and overall system quality and efficiency are also, in part, products of providing the primary health care system with the most cost-effective technologies and the resources needed to address problems at that level.[31] In view of this, the consultation encouraged development of criteria for patient referral from primary care settings to other levels and system-wide coordination to optimize efficiency.

Improvements in CVD and other NCD clinical outcomes are not due to isolated elements of care but to their reorganization into effective service delivery models.[32] We also know that CVD risk falls and CVDs themselves are better controlled when people are knowledgeable about healthy lifestyles, behavioral changes to avoid risk, and self-care measures.[33] Hence, the consultation affirmed the importance of an integrated chronic care model that promotes active participation and autonomy of persons with risk factors or NCDs, especially diabetes and hypertension, providing skill development and resources to enable health-promoting behaviors and self management.

Hypertension, high cholesterol and smoking together explain more than 80% of CVDs, but hypertension is the most powerful risk factor, associated with 62% of strokes and 49% of IHD cases.[34] Consequently, the consultation placed vital importance on strengthening actions to improve knowledge, treatment and control of hypertension, emphasizing early detection, appropriate choice and use of medications, and therapeutic adherence. It also encouraged CVD risk evaluation as part of preventive clinical services for all individuals, with treatment of patients at high risk, and in persons with hypertension and diabetes, called for greater efforts at early detection (and treatment) of chronic kidney disease.

It also recommended policies supporting high standards of efficiency and clinical safety by adoption of comprehensive continuous quality improvement programs to evaluate NCD services, certification and clinical audit systems, and the use of clinical guidelines adapted to needs, resources and local culture at all levels of the service network.[35]

Policies reinforcing rational medication use, promoting use of generic drugs, managing pricing and rationalizing spending bring about improvements in access to and availability of medications and essential technologies, as well as provision of comprehensive pharmacy services.[36,37] It is necessary then to develop policies

regulating medications and other technologies on the basis of quality, relative efficacy, added diagnostic and therapeutic value, social value and safety.

With respect to acute coronary syndrome and stroke, the consultation considered there was sufficient evidence[38–40] to prioritize six interventions directed at improving quality of care: 1) population communication and education strategies promoting efficient emergency system use, as well as recognition of symptoms and warning signs; 2) emergency medical services organized by geographically-defined populations, coordinated with the rest of the health system for greater efficiency; 3) broadened access to early reperfusion therapy, emphasizing shortening time between symptom onset and treatment initiation and on availability of basic technologies for early and safe intervention; 4) coronary and stroke units integrated with the health service system, giving priority to those patients at highest risk of complications and death; 5) early rehabilitation programs, broad in scope and of proven effectiveness, for social reintegration of patients; and 6) increased coverage of and access to secondary prevention.

Surveillance Active and sustained technical and financial support for CVD surveillance systems is critical for improving heart health,[41] so CVD surveillance must be integrated into the overall health information system, its operations guaranteed and its resources included in health system budgets. The consultation stressed the urgency of improving CVD mortality registry coverage and quality, as well as surveillance of risk and protective factors and morbidity. It also urged creation of a core minimum set of indicators for coverage, access and system performance; quality of care; costs and effectiveness of interventions; appropriateness of medication and technology use; and progress in applying national plans. These indicators should be sufficiently detailed to plan, implement and evaluate policies, strategies, services, technologies and interventions, and support research on effectiveness—including economic evaluations—and models of intersectoral prevention.

Permanent information diffusion and feedback between financiers and providers, respecting principles of good governance,[42] is key to reducing uneven information and to meeting expectations

Table 1: Priorities for health promotion and disease prevention in the Americas

PAHO Consultation Recommendation	Rationale
<p>Tobacco Accelerated implementation of the WHO Framework Convention on Tobacco Control (FCTC)</p>	<p>FCTC contains evidence-based, high impact, cost-effective—even cost-saving—measures to reduce tobacco use and prevent smoking initiation.[20]</p> <p>FCTC provides a legal framework and tools for international cooperation on tobacco control.</p>
<p>Salt Programs to reduce intake that are sustainable; adequately financed by governments; evidence-based; integrated with other food, nutrition and health education programs; and available to all</p> <p>Legislation, fiscal policy, and economic incentives to regulate salt content in all foods, compelling industry to set targets, and timelines for reducing salt content</p>	<p>Salt intake in almost all countries in the region is ≥ 2 times recommended limit (5 g/day/person).</p> <p>Reducing population salt intake is among the most cost-effective and cost-saving measures available.[21]</p> <p>Results of voluntary industry commitments have been poor (lessons from tobacco control).[22]</p>
<p>Healthy eating Sustainable agricultural policies to increase production, supply, access and acceptance of healthy foods and to reduce those of unhealthy foods</p> <p>Effective, evidence-based policies on pricing, production incentives, marketing and sale of healthy foods</p> <p>Policies to regulate promotion and marketing of foods to children and youth</p>	<p>Market availability and excess consumption of high-fat, high-calorie and unhealthy foods are influenced by agricultural policies and the entire supply chain.[23]</p> <p>Agricultural policies associated with changes in pricing and availability of foods—together with nutrient content regulation—influence food production models.[23]</p> <p>Food marketing and advertising influence preferences and diet.[24]</p> <p>Children and youth are particularly vulnerable, especially where marketing to them is unregulated.[25]</p>
<p>Physical activity Sustainable policies for urban planning, transportation and safety to create environments enabling people to live healthy, active, safe lives</p> <p>Healthy diets and 50 minutes of moderate daily exercise provided in schools</p>	<p>Physical activity increases with presence of parks, recreational areas, pedestrian-friendly policies, amenities to support cycling.[26]</p> <p>In some countries, up to 20% of children are obese or overweight.[27]</p> <p>Most children spend most of day in schools, usually safe places for physical exercise.</p> <p>Schools and teachers can help establish social norms valuing healthy diet and physical activity.</p>
<p>Alcohol Implementation of the WHO Global Strategy to Reduce the Harmful Use of Alcohol[28]</p>	<p>Harmful use of alcohol is a major risk factor globally.[28]</p>

Source: PAHO regional consultation 2010–2011.

of effectiveness and efficiency in health system activities, interventions and technologies.

Finally, with a view to integrating the proposed interventions and making them sustainable, the consultation suggested linking all the recommended actions in a coherent package pivoting on a common axis, avoiding fragmentation and ensuring institutional support and long-term financing of a concrete plan with budget allocation based on the burden and impact of CVDs, cost-effectiveness of interventions and their social value and budgetary impact, and the principle of equity, periodically adjusting health services packages according to these criteria.

NCDs on the Global Political Agenda


On September 19 and 20, 2011, heads of state and government representatives met at UN headquarters in New York City to discuss NCD prevention and control. It was an historic opportunity to frame NCDs on the global political agenda as one of the main obstacles to development in the 21st century, undermining social and economic progress and threatening achievement of internationally agreed-upon development goals. The resulting Political Declaration recognized that NCDs are a threat to the economies of many countries, that they can widen inequalities among countries and populations, that governments have ultimate responsibility for addressing these challenges, and that participation and commitment from all society's segments will be essential for effective responses to ensure the right of every person to optimal physical and mental health.[43]

Declaration followup will require close collaboration between the UN Secretary General and WHO's Director General, as well as

consultation with UN member states and other organizations. In 2012, they are asked to bring to the Assembly options for strengthening and facilitating multisectoral actions for NCD prevention and control. The Declaration further requests a report from the UN Secretary General to the 68th General Assembly in 2013 on progress toward agreed-upon commitments—particularly multisectoral actions and their effects on meeting international development objectives, including the Millennium Development Goals—as a basis for comprehensive review and progress evaluation in 2014.[43]

From Policy to Practice

Health priorities defined for the Americas are well aligned with both the letter and spirit of the Political Declaration of the UN High-Level Meeting on Non-Communicable Diseases. The Declaration will serve as a compass and platform from which these priorities—understood as policy options—can be incorporated into countries' goals, objectives and interventions to fulfill commitments contracted before the UN General Assembly, adapted to the particular public health, economic, political and social context of each member state.

Given the scope of the NCD crisis, many observers hoped to see more concrete objectives, tangible financial commitments, transparent accountability mechanisms, more comprehensive coordinated actions, more emphatic language, less questioning of conflicts of interest and more substantial measures. Nevertheless, there has been undeniable progress. The Declaration is a new element connecting the health agenda with other global agendas, sounding the alarm, pointing the way, defining strategies and, most importantly, pledging action. 

References

- Emberson JR, Whincup PH, Morris RW, Walker M. Re-assessing the contribution of serum total cholesterol, blood pressure and cigarette smoking to the aetiology of coronary heart disease: impact of regression dilution bias. *Eur Heart J*. 2003 Oct;24(19):1719–26.
- WHO. The World Health Report 2002. Reducing Risks, Promoting Healthy Life [Internet]. Geneva: World Health Organization; 2002 [cited 2011 Aug 20]. Available from: <http://www.who.int/whr/2002/en/>
- Schargrodsky H, Hernández R, Champagne BM, Silva H, Vinuela R, Silva Aycaquer LC, et al. CARMELA: Assessment of Cardiovascular Risk in Seven Latin American Cities. *Am J Med*. 2008 Jan;121(1):58–65.
- WHO. Prevention of Cardiovascular Diseases: guidelines for assessment and management of total cardiovascular risk. Geneva: World Health Organization; 2006.
- PAHO Regional Health Observatory. Indicadores Básicos de Salud. Mortalidad. Causas principales de defunción [Internet]. 2010 [cited 2011 Jul 15]; [about 1 screen]. Available from: http://ais.paho.org/phis/viz/mort_causasprincipales_It_oms.asp. Spanish.
- PAHO. Información y Análisis de Salud: Situación de Salud en las Américas: Indicadores Básicos 2009. Washington DC: Pan American Health Organization; 2009. Spanish.
- Kreatsoulas C, Anand SS. The impact of social determinants on cardiovascular disease. *Can J Cardiol*. 2010 Aug-Sep;26 Suppl C:8–13.
- The NCD Alliance [Internet]. Geneva: NCD Alliance; c2010. The Global Burden of NCDs: The Global Epidemic; 2010 [cited 2011 Jul 20]. Available from: <http://www.ncdalliance.org/node/11>.
- Suhrcke M, Nugent RA, Stuckler D, Rocco L. Chronic Disease: An economic perspective [Internet]. London: Oxford Health Alliance; 2006 [cited 2011 Jan 20]. 60 p. Available from: <http://www.sehn.org/tccpdf/Chronic%20disease%20economic%20perspective.pdf>.
- Ordúñez-García P, Campillo-Artero C, editors. Regional consultation: priorities for cardiovascular health in the Americas. Key messages for policymakers. Washington DC: Pan American Health Organization; 2011.
- PAHO. Regional strategy and plan of action on an integrated approach to the prevention and control of chronic diseases [Internet]. Washington DC: Pan American Health Organization; 2007 [cited 2011 Sep 26]. Available from: <http://www.paho.org/english/ad/dpc/nc/reg-strat-cncls.pdf>.
- Beaglehole R, Bonita R, Horton R, Adams C, Alleyne G, Asaria P, et al. Priority actions for the non-communicable disease crisis. *Lancet*. 2011 Apr 23;377(9775):1438–47.
- Fuster V, Kelly BB, editors. Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries; Institute of Medicine. Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health. Washington DC: National Academies Press; 2010. 484 p.
- Geneau R, Stuckler D, Stachenko S, McKee M, Ebrahim S, Basu S, et al. Raising the priority of preventing chronic diseases: a political process. *Lancet*. 2010 Nov 13;376(9753):1689–98.
- Diez Roux AV, Mair C. Neighborhoods and health. *Ann NY Acad Sci*. 2010;1186:125–45.
- Pereira M, Lunet N, Azevedo A, Barros H. Differences in prevalence, awareness, treatment and control of hypertension between developing and developed countries. *J Hypertens*. 2009 May;27(5):963–75.
- WHO; Commission on Social Determinants of Health. Closing the Gap in a generation: Health equity through action on the Social Determinants of Health. Final Report of the Commission on Social Determinants of Health. Geneva: World Health Organization; 2008. 256 p.
- WHO. The World Health Report 2008. Primary Care. Now more than ever. Geneva: World Health Organization; 2008.
- PAHO. Impacto de la exclusión de servicios de salud en el acceso a medicamentos. Análisis comparativo de la situación en Guatemala, Honduras y Nicaragua. Washington DC: Pan American Health Organization; 2011. Spanish.
- WHO. Framework Convention on Tobacco Control. Geneva: World Health Organization; 2005.
- Campbell N, Legowski B, Legetic B, Wilks R, Pinto de Almeida Vasconcellos AB. PAHO/WHO Regional Expert Group Policy Statement—Preventing cardiovascular disease in the Americas by reducing dietary salt intake population-wide. *CVD Prevention and Control*. 2010;4(4):189–91.
- Brownell KD, Warner KE. The Perils of Ignoring History: Big Tobacco Played Dirty and Millions Died. How Similar Is Big Food? *Milbank Q*. 2009 Mar;87(1):259–94.

23. Hawkes C, Blouin C, Henson S, Drager N, Dubé L, editors. *Trade, Food, Diet and Health: Perspectives and Policy Options*. Oxford: Wiley Blackwell; 2010 Jan. 336 p.
24. Brownell KD, Schwartz MB, Puhl RM, Henderson KE, Harris JL. The need for bold action to prevent adolescent obesity. *J Adolesc Health*. 2009 Sep;45(3 Suppl):S8–17.
25. WHO. Set of recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva: World Health Organization; 2010. 16 p.
26. Gomez LF, Sarmiento OL, Parra DC, Schmid TL, Pratt M, Jacoby E, et al. Characteristics of the built environment associated with leisure-time physical activity among adults in Bogotá, Colombia: A Multilevel Study. *J Phys Act Health*. 2010 Jul;7 Suppl 2:S196–203.
27. Freedman DS; Centers for Disease Control and Prevention (CDC). Obesity—United States, 1988–2008. *MMWR Surveill Summ*. 2011 Jan 14;60 Suppl:73–7.
28. WHO. Global strategy to reduce the harmful use of alcohol [Internet]. Geneva: World Health Organization; 2010 [cited 2011 Sep 20]. Available from: http://www.who.int/substance_abuse/alcstratenglishfinal.pdf
29. Dubois CA, Singh D, Jiwani I. The human resource challenge in chronic care. In: Nolte E, McKee M, editors. *Caring for people with chronic conditions: A health system perspective*. Maidenhead (GB): Open University Press; 2008. p. 143–71.
30. Curry N, Ham C. Clinical and service integration. The route to improve outcomes. London: The King's Fund; 2010 Nov 22. 56 p.
31. PAHO. *Redes integradas de servicios de salud: conceptos, opciones de política y hoja de ruta para su implementación en las Américas*. Washington DC: Pan American Health Organization; 2010 May. 102 p. Spanish.
32. Ham C. The ten characteristics of the high-performing chronic care system. *Health Econ Policy Law*. 2010 Jan;5(Pt 1):71–90.
33. Battersby M, Von Korff M, Schaefer J, Davis C, Ludman E, Greene SM, et al. Twelve evidence based principles for implementing self-management support in primary care. *Jt Comm J Qual Patient Saf*. 2010 Dec;36(12):561–70.
34. WHO. *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva: World Health Organization; 2009. 70 p.
35. World Alliance for Patient Safety. *Summary of the evidence on patient safety: implications for research*. Geneva: World Health Organization; 2008.
36. Puig-Junoy J, Peiró S. De la utilidad de los medicamentos al valor terapéutico añadido y a la relación costo-efectividad incremental. *Rev Esp Salud Pública*. 2009 Jan-Feb;83(1):59–70. Spanish.
37. WHO. *Equitable access to essential medicines: a framework for collective action*. WHO Policy Perspectives on Medicines No. 8. Geneva: World Health Organization; 2004 Mar. 6 p.
38. Krumholz HM, Anderson JL, Bachelder BL, Fesmire FM, Fihn SD, Foody JM, et al. ACC/AHA 2008 performance measures for adults with ST-elevation and non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures. *Circulation*. 2008 Dec 9;118(24):2596–648.
39. National Institute for Health and of Clinical Excellence (GB). *Unstable angina and NSTEMI*. London: NICE; 2010 Mar.
40. Schwamm LH, Fayad P, Acker JE 3rd, Duncan P, Fonarow GC, Girgus M, et al. *Translating evidence into practice: A decade of efforts by the American Heart Association/ American Stroke Association to reduce death and disability due to stroke*. *Stroke*. 2010 May;41(5):1051–65.
41. Bonita R. Guest Editorial: Strengthening NCD prevention through risk factor surveillance. *Glob Health Action*. 2009 Sep 28;2.
42. Campillo Artero C. [Integration of information for health interventions: from data to information and from information to action. Report of the Spanish Society of Public Health]. *Gac Sanit*. 2008 Apr;22 Suppl 1:14–8. Spanish.
43. United Nations. General Assembly. Sixty-sixth Sessions. Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. A/66/L.1 [Internet]. New York: United Nations; 2011 Sep 16 [cited 2011 Sep 26]. Available: <http://daccess-dds-ny.un.org/doc/UNDOC/LTD/N11/497/77/PDF/N1149777.pdf?OpenElement>.

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