

Rheumatic heart disease

Report by the Secretariat

1. Rheumatic heart disease is a preventable yet serious public health problem in low- and middle-income countries and in marginalized communities in high-income countries, including indigenous populations.
2. The disease results from damage to heart valves caused by one or several episodes of rheumatic fever, an autoimmune inflammatory reaction to throat infection caused by group A streptococci (streptococcal pharyngitis). It most commonly occurs in childhood, and can lead to death or life-long disability. Effective early intervention can prevent premature mortality from rheumatic heart disease.
3. Around 33 million people are currently thought to be affected by rheumatic heart disease,¹ and in 2015 rheumatic heart disease was estimated to have been responsible for 305 000 deaths and 11.5 million disability-adjusted life years lost. Of these deaths 60% occurred prematurely (that is, before the age of 70 years), although these figures are very uncertain owing to incomplete data in many countries. Despite the availability of effective measures for prevention and treatment, there has been little change in the contribution of rheumatic heart disease to overall global mortality between 2000 and 2015.²
4. Rheumatic heart disease persists in all WHO regions. The African, South-East Asia and the Western Pacific regions are the worst affected, accounting for 87% of all prevalent cases and 80% of all estimated deaths due to rheumatic heart disease in 2015.¹ India, in the South-East Asia Region, has the highest global prevalence, with about 40% of all cases globally. In the Western Pacific Region, the burden of rheumatic heart disease is especially concentrated in China and indigenous populations living in Australia, New Zealand and the Pacific island States. In the Eastern Mediterranean Region, rheumatic heart disease persists in certain countries such as Egypt, Sudan and Yemen. Overall, however, the lack of good and reliable data from most regions means that the regional burdens of rheumatic heart disease may be underestimated.
5. Rheumatic heart disease disproportionately affects girls and women. The risk of developing rheumatic heart disease is up to two times higher for females than males, and females accounted for two thirds of patients with rheumatic heart disease admitted to selected hospitals in 12 countries in the African Region, India and Yemen. Where rheumatic fever and rheumatic heart disease are endemic,

¹ Global Health Data Exchange; <http://ghdx.healthdata.org/> (accessed 31 March 2017).

² Global Health Estimates 2015: Geneva: World Health Organization; 2016.

rheumatic heart disease is the principal heart disease seen in pregnant women, causing significant maternal and perinatal morbidity and mortality.

6. Socioeconomic and environmental factors such as poor housing, undernutrition, overcrowding and poverty are well known contributors to the incidence, magnitude and severity of rheumatic fever and rheumatic heart disease.

7. The economic cost to countries with a persistently high incidence of rheumatic heart disease is significant. The most devastating effects are on children and young adults in their most productive years. The global cost of deaths due to rheumatic heart disease in 2010 was estimated to be US\$ 2200 billion (discounted) or US\$ 5400 billion (undiscounted). Rheumatic fever and rheumatic heart disease lead to increased school absenteeism and drop-out, and lost wages. In one example from Brazil, rheumatic fever cost the affected family annually about US\$ 97/patient, and cost society annually US\$ 320/patient, whereas a secondary prevention programme cost US\$ 23/patient annually.

TOWARDS PREVENTION, CONTROL AND ELIMINATION

8. The prevention, control and elimination or eradication of rheumatic heart disease is increasingly being recognized as an important developmental issue by Member States. In 2015, African Union Heads of State and Government at their 25th summit endorsed the Addis Ababa Communiqué on Eradication of Rheumatic Heart Disease in Africa, which recommends several key actions for consideration by African governments.¹

9. WHO's Global Action Plan for the Prevention and Control of Noncommunicable diseases 2013–2020 in actions proposed for Member States calls for a 25% reduction in premature mortality from noncommunicable diseases by 2025 and for the secondary prevention of rheumatic fever and rheumatic heart disease. Moreover, the targets for Sustainable Development Goal 3 (Ensure healthy lives and promote well-being for all at all ages) include reducing premature mortality from noncommunicable diseases by one third, ending preventable deaths of newborn and children under 5 years of age, and reducing the global maternal mortality ratio to <70/100 000 live births, all by 2030. Most deaths from rheumatic heart disease are premature, and controlling and eliminating rheumatic heart disease will contribute to fulfilling all global goals.

10. There are three levels of prevention for rheumatic heart disease: reducing the risk factors (primordial prevention); primary prevention of rheumatic fever; and secondary prophylaxis. Primordial prevention aims to avoid episodes of streptococcal pharyngitis by tackling poverty, improving living and housing standards, and increasing access to health care. Most of the observed secular trends in reductions in prevalence of rheumatic heart disease globally are due to improved primordial prevention.

11. Primary prevention of rheumatic fever can be achieved through the effective treatment of streptococcal pharyngitis with penicillin and is most effective when delivered as part of routine child health care and integrated into existing health strategies and community programmes. For that, more

¹ See http://www.pascal.org/uploads/files/ADDIS_ABABA_COMMUNIQUE%3%89_ON_ERADICATION_OF_RHEUMATIC_HEART_DISEASE_IN_AFRICA_-_Submission1.pdf, and Watkins D, Zuhlke L, Engel M, et al. Seven key actions to eradicate rheumatic heart disease in Africa: the Addis Ababa communique. *Cardiovascular Journal of Africa* 2016; 27(3):184-7 (http://www.pascal.org/uploads/files/CVJA_Addis-Ababa-Communique-2016.pdf; both accessed 31 March 2017).

effective strategies for diagnosis are needed. Group A streptococcal infection accounts for 20–40% of cases of pharyngitis in children. Compared with culture of throat swabs, rapid antigen detection tests offer diagnosis at the point of care and therefore need to be part of such strategies.

12. Secondary prophylaxis through the monthly administration of injections of benzathine benzylpenicillin to patients with a previous history of rheumatic fever and/or rheumatic heart disease is effective at preventing streptococcal pharyngitis and a recurrence of rheumatic fever. It requires case finding, referral, registration, administration of penicillin injections and regular follow-up. Establishment of registries of known patients has proven to be effective in reducing morbidity and mortality, and these sources should be included in existing national disease surveillance mechanisms, where available.

13. For countries where rheumatic heart disease is endemic the main strategies for prevention, control and elimination include: improving standards of living; expanding access to appropriate care; ensuring a consistent supply of quality-assured antibiotics for primary and secondary prevention; and planning, development and implementing feasible programmes for prevention and control of rheumatic heart disease, supported by adequate monitoring and surveillance, as an integrated component of national health systems responses.

14. Potential future research areas may include: better understanding of disease epidemiology and case detection; further elucidation of the pathogenic mechanisms of disease, aiming to identify new pathways amenable to therapeutic intervention and to inform vaccine development and application; development of a safe and effective group A streptococcal vaccine; and development of a long-acting formulation of penicillin that might improve adherence to secondary prophylactic regimens.

BARRIERS TO PROGRESS

15. The main barriers to prevention, control and elimination of rheumatic heart disease are: the neglect of rheumatic fever and rheumatic heart disease in national health policies and budgets in countries in which rheumatic heart disease is endemic; the paucity of data to enable targeting of prevention efforts; poor primary and secondary prevention and access to primary health care; inadequate numbers and training of health workers at all levels; limited understanding of rheumatic fever and/or rheumatic heart disease in affected communities; and inaction on the social determinants of the disease and inequities in health. Although further research in some areas is needed, it is proposed that the biggest gap in control of rheumatic heart disease is in implementing effective primary and secondary preventive measures.

16. Ensuring a consistent supply of quality-assured benzathine benzylpenicillin for secondary prophylaxis is a significant challenge in some settings. The continued availability of some essential medicines including benzathine benzylpenicillin appears to be further threatened because prices have become so low that it seems no longer commercially viable for manufacturers to supply them.

THE SECRETARIAT'S RESPONSE TO DATE

17. The last WHO global programme for the prevention and control of rheumatic heart disease covered the period 1984 to 2000. Its results demonstrated that the prevalence of and premature mortality from rheumatic heart disease can be substantially reduced through a combination of simple measures. The programme was based largely on secondary prevention (case finding, registration, secondary prophylaxis, training of personnel and health education). Through this programme, 1.5 million schoolchildren were screened in order to improve case finding and 25 000 health and

education staff were trained. China, Cuba, Egypt, India and the Philippines saw improvements in the quality of care for patients with acute rheumatic fever and rheumatic heart disease and impressive reductions in prevalence of rheumatic heart disease.

MOVING FORWARD

18. Recommended actions for Member States include the following.

(a) Develop and implement national programmes in countries where rheumatic fever and rheumatic heart disease remain significant health problems. To ensure sustainability, these programmes should be integrated in national health development plans and delivered through the existing national infrastructure of the health ministries (including units concerned with women's, children's and adolescents' health and noncommunicable diseases) and education ministries, avoiding the establishment of a new administrative or delivery frameworks.

(b) Improve appropriate identification and antibiotic treatment of group A streptococcal pharyngitis in high-risk groups. Use rapid antigen detection tests, which can facilitate diagnosis at the point of care. Reliable and timely data on the incidence of acute rheumatic fever are needed in order to institute the prompt delivery of prophylaxis for individuals and primordial prevention measures at population level. High-quality reference laboratories for streptococci must be available.

(c) Improve identification and secondary prophylaxis of rheumatic heart disease. Implement adequate monitoring to provide regular secondary prophylaxis to people who have had acute rheumatic fever or rheumatic heart disease, especially in settings where there is a high-risk of loss to follow-up, such as relocation centres, and junctures such as the transition from adolescence to adulthood.

(d) Ensure the consistent supply of injectable benzathine benzylpenicillin in primary care facilities that are free at point of care, and implement proactive measures to ensure it is delivered in an accessible and timely manner to those with a history of rheumatic fever or rheumatic heart disease.

(e) As part of measures to promote appropriate use of antibiotics, educate professionals and the public about the need for prompt and complete antibiotic treatment for group A streptococcal pharyngitis in settings where rheumatic fever remains a problem.

(f) Improve access to specialist diagnosis and surgical treatment, as needed. The facilities available should include specialist monitoring of rheumatic heart disease in pregnancy to prevent complications and maternal deaths and appropriate valve surgery in cases of severe valve damage.

(g) Take measures to address the known determinants of rheumatic fever and rheumatic heart disease, including poor housing, overcrowding and delayed access to primary health care.

(h) Foster increased international collaboration and resource mobilization to pursue the goal of prevention, control and elimination of rheumatic heart disease through bilateral, regional and multilateral channels.

19. Actions for Secretariat include the following.

- (a) Launch a coordinated global response to pursue the goal of prevention, control and elimination of rheumatic heart disease, aligning specific areas of work in relation to advocacy, treatment guidelines, access to essential medicines, neglected tropical diseases, and women's, children's and adolescents' health.
- (b) Update technical documents and guidelines on identification and clinical management of group A streptococcal pharyngitis, rheumatic fever and rheumatic heart disease, as well as on methods of targeting high-risk groups, early detection and management, including appropriate use of antibiotics.
- (c) Provide technical support to Member States on developing and implementing national programmes for the prevention and control of rheumatic heart disease in endemic areas.
- (d) Work with pharmaceutical manufacturers and governments to ensure continuous supply of quality-assured benzathine benzylpenicillin and improve the consistency of availability at community and primary care levels in affected countries.
- (e) Convene stakeholders in order to advance a prioritized research agenda aimed at:
 - (i) a better understanding of the epidemiology and pathogenic mechanisms of disease;
 - (ii) the development of a safe and effective group A streptococcal vaccine;
 - (iii) the development of a long-acting penicillin formulation that might improve adherence to secondary prophylaxis regimens.

ACTION BY THE EXECUTIVE BOARD

20. The Board is invited to note the report.

= = =