



# Role of Global Alliance against Chronic Respiratory Diseases (GARD) in achievement of the UN sustainable development goals (SDG) and targets

Nikolai Khaltaev<sup>1</sup>, Svetlana Akselrod<sup>2</sup>

<sup>1</sup>Global Alliance Against Chronic Respiratory Diseases, Geneva, Switzerland; <sup>2</sup>High School of Health Administration, First Moscow Medical Academy, Moscow, Russia

Correspondence to: Nikolai Khaltaev. Global Alliance Against Chronic Respiratory Diseases, Geneva 1208, Switzerland. Email: khaltaevn@bluewin.ch.

Submitted May 21, 2021. Accepted for publication Jul 20, 2021.

doi: 10.21037/jtd-21-857

View this article at: <https://dx.doi.org/10.21037/jtd-21-857>

In 2017 WHO Director General announced the establishment of a WHO Independent High-Level Commission on noncommunicable diseases (NCD) as a high-level political tool to achieve the UN Agenda for sustainable development goals (SDG) and targets in particular target 3.4 “*by 2030, reduce by one third premature mortality from NCD through prevention and treatment, and promote mental health and well-being*” (1).

First report published by the Commission in June 2018 “Time to Deliver” (2) indicated the decline in cardiovascular diseases (CVD) and chronic respiratory diseases (CRD) mortality. However, the global rate of decline in deaths from NCD (CVD, CRD, cancers and diabetes) 17% from 2000 and 2015 is still not enough to meet the SDG target 3.4 by 2030. Second meeting of the Commission 2019 identified the challenges to implementation and recommended WHO to encourage governments to promote meaningful engagement with civil society for the prevention and control of NCD and promotion of mental health. It can be accomplished by including the participation of nongovernmental organizations (NGO) in national platforms through which to coordinate NCD action, with a view towards encouraging a greater range of voices to be heard, including from those living with NCD. Commission recommended including civil society meaningfully in WHO governance (at all levels of the organizations). Multi-stakeholder partnerships and alliances that mobilize and share knowledge, assess progress, provide services and amplify the voices and raise awareness about people living with and affected by NCD (3).

Global Alliance against Chronic Respiratory Diseases (GARD) is a WHO voluntary alliance of national and

international organizations, institutions, and agencies committed towards the common goal to reduce the global burden of CRD (4). GARD is a part of the WHO global work to prevent and control chronic diseases (5).

The vision of GARD “a world where all people breathe freely” is common not only to CRD but also to CVD certain types of cancer and diabetes. In view of this GARD could serve as an excellent vehicle to deliver major NCD prevention and control tools to facilitate achievements of UN SDG. GARD has four strategic directions: advocacy, focused on raising of the recognition of CRD at global, regional, and country levels and integration of the prevention and control measures into policies across all government departments, promotion of partnership, development of national plans on prevention and control and surveillance focused on supporting WHO in monitoring CRD and their risk factors to evaluate progress at all levels. They fully correspond to the High Commission recommendations on accelerating actions to engage civil society in national NCD response through strengthening advocacy, awareness raising, improving access to care through service delivery, and accountability. All major international, regional and national organizations, institutions and agencies focused on reducing the global burden of CRD became GARD members (6). GARD has a fruitful collaboration with *Journal of Thoracic Disease (JTD)* on a special section in this journal. JTD is a multidisciplinary internationally recognized journal of pulmonologists, cardiologists, oncologists and other specialists.

In order for the strengthening activities of the alliance

**Table 1** Dynamics of major non-communicable diseases mortality 2000–2016

Diseases	2000	2010	2016
Chronic respiratory disease			
COPD	25.6±13.9	19.7±8.8	18.2±7.5
Asthma	2.94±3.01	1.67±1.84	1.34±1.43
Cardiovascular disease			
Ischaemic heart disease	150.4±83.7	119.8±86.7	105.7±78.6
Stroke	76.4±45.6	53.9±36.6	43.7±31.0
Lung cancer, diabetes			
Lung cancer	25.4±10.0	24.1±9.5	22.4±8.6
Diabetes mellitus	25.3±31.6	24.6±34.2	23.4±31.0

COPD, chronic obstructive pulmonary disease.

to meet the specific needs of countries, national alliances were established (GARD country) with a view to provide a coordination role and create the necessary momentum to strengthen the national capacity to face the increasing impact of CRD (4). GARD country activities in particular in the area of tobacco cessation and studies on traffic related air pollution are common for major NCD (7).

To preliminary assess the achievements of SDG and demonstrate global mortality trends from the year 2000 we used the latest available national information on mortality and its causes submitted to WHO together with the latest available information from global WHO programmes for causes of deaths of public health importance (8). Only countries with multiple years of national death registration by cause, sex and age and high completeness and quality of cause of death assignments were included in our analysis. Disease specific mortality as age-standardized death rates per 100,000 from 2000 to 2016 with the interim analysis in 2010 has been analysed in 49 countries. Thirty-six countries (Australia, Austria, Bahamas, Belgium, Brunei Darussalam, Canada, Chile, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxemburg, Malta, Netherlands, New Zealand, Norway, Republic of Korea, Slovakia, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, and United States of America) belong to high income countries (HIC) according to the World Bank

classification, and 13 countries (Armenia, Brazil, Cuba, Grenada, Guatemala, Kyrgyzstan, Mauritius, Mexico, North Macedonia, Republic of Moldova, Romania, Saint Vincent and the Grenadines, and Uzbekistan) belong to middle income countries (MIC) (9). GARD has been officially launched or initiated in 19 analysed countries (42%) (4).

The most visible statistically significant decline in NCD mortality from 2000 to 2016 was achieved for bronchial asthma 54%, stroke 43%, ischaemic heart disease (IHD) 30% and chronic obstructive pulmonary disease (COPD) 29%.

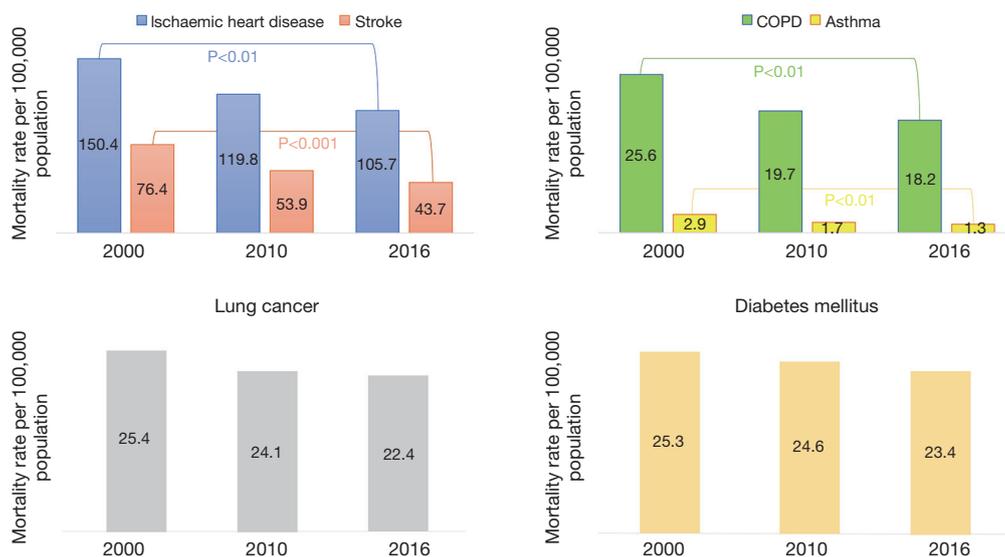
Lung cancer and diabetes mortality declined by 12% and 8% and these changes were not statistically significant (*Table 1, Figure 1*).

We analysed prevalence of tobacco smoking, obesity and raised blood pressure (RBP)\* in the countries for the same period of time from 2000 to 2015 (10). Prevalence of tobacco smoking gradually declined in 84% of countries, did not change in 9% and increased only in 7%. Good progress has been achieved in declining RBP. Fifty-five percent of countries demonstrated declining prevalence of RBP, 24% no changes and 20% increasing prevalence of the RBP. Regretfully obesity\*\* prevalence was increasing in all countries.

Highest among all NCD decline of asthma mortality is closely associated with the activities of the first global CRD programme initiated by WHO and the US-based National Heart Lung and Blood Institute (NHLBI) called

\* The percentage of the population 18 years and older having systolic blood pressure (BP)  $\geq 140$  mmHg and /or diastolic BP  $\geq 90$  mmHg.

\*\* The percentage of the population 18 years and older having a body mass index  $\geq 30$  kg/m<sup>2</sup>, the percentage of the population  $\geq 10$  years who are more than 2 standard deviation (SD) above the median of the WHO growth reference for children and adolescents.



**Figure 1** Age-standardized NCD mortality rate per 100,000 population in selected countries, both sexes, 2000–2016. NCD, noncommunicable diseases.

Global Initiative on Asthma (GINA) (11) later transformed to NGO and one of the GARD founders. GINA played a key role in promoting asthma management and prevention worldwide. Annual World Asthma Day 5<sup>th</sup> May initiated by WHO in 1998 disseminated GINA recommendations in all WHO regions. Tobacco cessation and other life style modifications along with asthma management always remain key messages of this global campaign. GINA initiative was well implemented in all analysed GARD countries and globally and no doubt contributed to major NCD risk factors control, in particular smoking.

WHO international guidelines dealing specifically with RBP was published in 1999 (12) and had a global distribution and implementation in collaboration with WHO, national and international partners in the area of CVD. In the past decades, WHO has included diagnosis and management of hypertension in a total cardiovascular risk approach as part of the WHO Package of Essential NCD interventions 2007, 2010 and 2013 (PEN) (13). Annual WHO World Hypertension Day regularly shared country and partner experience in implementing hypertension programmes.

Percentage of IHD and COPD decline well corresponds to SDG 3.4 and our task is to maintain and further improve these dynamics.

CVD and in particular IHD and atherosclerosis prevention and control approach and initiatives have a long history and became a basis for NCD community-

based prevention and control. Pioneering epidemiological Framingham Heart Study initiated in 1948–1950 focused on hypertension and CVD had a dramatic contribution to the risk factors conception and based on this preventive approach (14). Community-based North Karelia intervention programmes demonstrated success of the country wide CVD and major NCD prevention programme and further proved the modern risk factors conception and integrated approach for NCD prevention based on the commonality of risk factors (15).

Multiple WHO global, regional and national prevention and control programmes have dramatically improved awareness about healthy life style, surveillance, and management of atherosclerosis and IHD. It has become evident that most premature deaths due to CVD can be avoided with combination of the live style modification interventions to prevent disease, early treatment to avert death during acute events (heart attacks and stroke) and regular treatment to prevent recurrent events and to prolong the lives of people with prior CVD. Reduction in burden and mortality from CVD in HIC reflects a combined impact of population interventions to reduce risk factors based on the life-style modifications and treatment (16).

Success in COPD decline is closely associated with GARD and GARD partners activities in particular with initiated by WHO and the US-based NHLBI Global Initiative for COPD GOLD (17). Launched in 2001 GOLD like GINA became one of the GARD founders

and brought COPD to the attention of governments, public health officials, health care workers and the general public. GOLD promoted concerted efforts by all involved in health care to increase awareness and control of this major NCD. Life style modifications in particular smoking control implemented by GOLD are common for all major NCD and are intensively promoted during annual World COPD Day 18 November. COPD and CVD often coexist in one patient therefore commonality in management is obvious. Decreased pulmonary function in COPD is closely associated with an increased risk of congestive CVD. A large proportion of patients with mild and moderated COPD die due to CVD, which is much more likely than deaths in the same group due to respiratory insufficiency. COPD patients have a higher rate of hospitalization and death, the cause of which are IHD, stroke and congestive heart failure (17).

Special attention should be paid to pulmonary rehabilitation (PR) which is the most effective intervention to improve the quality of life in COPD patients and integrated component of the disease management strategy. PR can reduce readmission and mortality in patients (17). PR becomes crucial now in coronavirus (COVID) epidemic for the millions of post-COVID patients since respiratory illness is the dominant clinical manifestation of coronavirus disease 2019 (COVID-19), a highly infectious respiratory tract disease which can cause respiratory, physical, and psychological dysfunction in patients. Therefore, PR is important for both admitted and discharged patients with COVID-19 (18).

CVD involvement of COVID-19 patients occurs much less commonly. Acute cardiac injury, defined as significant elevation of cardiac troponins, is the most commonly reported cardiac abnormality. It occurs in approximately 8–12% of all patients along with the heart failure, circulatory shock, cardiomyopathy, arrhythmia, and vascular thrombosis. Nonetheless, it has been shown that the presence of pre-existing CVD and development of acute cardiac injury are associated with significantly worse outcome in these patients (19).

Lung cancer and diabetes mortality dynamics differs from CVD and CRD picture. We have chosen lung cancer out of 24 different forms of cancer registered in the WHO mortality report (8) since it's a most common lethal neoplasm in the world with very poor prognosis (20). Smoking plays a key role in lung cancer development but it may also occur in people who have never smoke, other risk factors impact should be also considered in this case such as passive exposure to tobacco smoke, biomass fuel,

diesel exhaust, radon, asbestos and other environmental and workplace carcinogens. Cancer patients in general and those suffering from lung cancer in particular are a vulnerable group in COVID-19 era. Different types of lung cancer treatments (chemotherapy, radiation therapy and immunotherapy) may also influence the risk of infection. Lung cancer patients require frequent radiologic study follow ups which may be affected by COVID-19 pandemic. COVID-19 related incidental radiologic findings can appear in routinely scheduled radiology tests, which may be difficult to interpret. Cancer treatment also induces pneumonitis with similar radiologic features like in acute COVID-19 pneumonia and leads to a wrong diagnosis (21).

According to various estimates, excess weight and obesity are closely linked with type 2 diabetes. Practically no changes of diabetes mortality in our case were observed with growing prevalence of obesity. In the current COVID-19 pandemic situation, diabetes has become a serious health concern as it is one of the most frequent comorbidities in people with COVID-19 with prevalence from 7% to 30%. Diabetics infected with COVID-19 have a higher rate of hospital admission compared to non-diabetics, severe pneumonia, and higher mortality. Recent evidence has shown that COVID-19 is also capable of causing direct damage to the pancreas that could increase hyperglycaemia and even induce the onset of diabetes in previously non-diabetic subjects (22). Diabetes care has been severely shattered due to the pandemic. In view of the above new WHO Global Compact was launched to speed up action to tackle diabetes and provide a much-needed boost to efforts to prevent diabetes and bring treatment to all who need it. *“It is the only major NCD for which the risk of dying early is going up, rather than down”* said Dr. Tedros Ghebreyesus WHO Director General. GARD representatives along with other UN agencies, civil society partners and representatives of the private sector took part in the launch (23).

Our analysis has shown that the most visible decline seen for asthma and RBP is associated with declining smoking prevalence and promotion of global management programmes. Gradually increasing prevalence of obesity does not prevent these declines.

Air pollution reduction and clean air strategy could help to maintain and further improve CRD management and prevention. Life style modifications besides tobacco use like decreasing salt consumption, increasing fruits and vegetables intake, decreasing saturated and trans fats consumption, limited use of alcohol and elevated level of physical activity and effective obesity control have a great

potential for further decline of CVD.

Since lung cancer has a very poor prognosis, in order to achieve better results in cancer mortality along with early detection, more efforts should be concentrated on strengthening tobacco cessation, clean air and diet actions.

Since overweight and obesity control remain a big challenge in majority of countries, diet and physical activity along with adequate management remain the key elements in the current strategy for diabetes control and decreasing diabetes mortality. Further decline in smoking prevalence will have an additional positive effect (24). Association of diabetes mortality with air pollution is interesting and perspective since air pollution affects nearly every organ in the body, causing or contributing to many illnesses, in view of this GARD role in clean air policy is crucial. Last GARD General Assembly was dedicated to air pollution and proper recommendations concerning NCD prevention have been made (25).

GARD has always been active in global life style modification activities like, World No Tobacco Day, World Health Day and many others. The focus of the No Tobacco Day 2019 for instance was “tobacco and lung health”. The campaign aimed to increase awareness on the negative impact that tobacco has on people’s lung health from cancer to CRD or CVD and on the fundamental role lungs play for the health and well-being of all people. In view of the COVID-19 pandemic GARD considered the potential impact of the COVID-19 on accomplishment of the SDG during the global webinar conference (26).

## Acknowledgments

*Funding:* None.

## Footnote

*Provenance and Peer Review:* This article was commissioned by the GARD Section Directors (Yousser Mohammad, Alvaro A. Cruz) for the “GARD Section” published in *Journal of Thoracic Disease*. The article was sent for external peer review organized by the section directors and the editorial office.

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://dx.doi.org/10.21037/jtd-21-857>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

*Open Access Statement:* This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

## References

1. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. New York: United Nations; 2018. Available online: <https://sustainabledevelopment.un.org/post2015/transformingourworld>. [Accessed August 16, 2018].
2. World Health Organization. Time to deliver: report of the WHO Independent high-level commission on noncommunicable diseases. Geneva: World Health Organization; 2018. Available online: <http://www.who.int/iris/handle/10665/272710>
3. World Health Organization. WHO Independent high-level commission on noncommunicable diseases: final report: it's time to walk the talk. 2019. Available online: <https://apps.who.int/iris/handle/10665/330023>. License: CCBY-NC-SA 3.0 IGO.
4. Khaltayev N. GARD, a new way to battle with chronic respiratory diseases, from disease oriented programmes to global partnership. *J Thorac Dis* 2017;9:4676-89.
5. World Health Organization. Thirteenth General Programme of Work 2019–2023. Geneva: World Health Organization; 2018. Available online: <http://www.who.int/about/what-we-do/gpw-thirteen-consultation/en/>. [Accessed August 16, 2018].
6. Bousquet J, Khaltayev N editors. Global Surveillance, prevention and control of Chronic Respiratory Diseases. A comprehensive approach. World Health Organization 2007:155.
7. Bousquet J, Mohammad Y, Bedbrook A, et al. Country activities of Global Alliance against Chronic Respiratory Diseases (GARD): focus presentations at the 11th GARD

- General Meeting, Brussels. *J Thorac Dis* 2018;10:7064-72.
8. World Health Organization. Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2016. Geneva: World Health Organization; 2018.
  9. World Bank Data Team. New country classifications by income level:2018–2019. Available online: <https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2018-2019>
  10. World Health Organization. Noncommunicable Diseases Country Profiles 2018. Geneva: World Health Organization; 2018. Available online: <https://apps.who.int/iris/handle/10665/274512>
  11. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. NHLBI/WHO Workshop Report (Based on March 1993 Meeting). National Institutes National of Health, National Heart, Lung, and Blood Institute, Publication Number 95-3659, January 1995:176.
  12. 1999 World Health Organization–International Society of Hypertension Guidelines for the Management of Hypertension. Guidelines Subcommittee. *J Hypertens* 1999;17:151-83.
  13. Package of essential noncommunicable (PEN) disease interventions for primary health care. Geneva: World Health Organization, 2010. Available online: [http://www.who.int/cardiovascular\\_diseases/publications/pen2010/en](http://www.who.int/cardiovascular_diseases/publications/pen2010/en) (accessed 15 July 2016).
  14. Franklin SS, Wong ND. Hypertension and Cardiovascular Disease: Contribution of the Framingham Heart Study. *Global Heart* 2013;8: 49-57.
  15. Puska P. Successful prevention of non-communicable diseases:25-year experiences with North Karelia Project in Finland. *Public Health Medicine* 2002;4:5-7.
  16. Ezzati M, Obermeyer Z, Tzoulaki I, et al. Contributions of risk factors and medical care to cardiovascular mortality trends. *Nat Rev Cardiol* 2015;12:508-30.
  17. Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. NHLBI/WHO Workshop Report (based on April 1998 meeting) National Institutes of Health National Heart, Lung, and Blood Institute, Publication number 2701, April 2001:100.
  18. Zampogna E, Paneroni M, Belli S, et al. Pulmonary Rehabilitation in Patients Recovering from COVID-19. *Respiration* 2021;100:416-22.
  19. Mahenthiran AK, Mahenthiran AK, Mahenthiran J. Cardiovascular system and COVID-19: manifestations and therapeutics. *Rev Cardiovasc Med* 2020;21:399-409.
  20. Forum of International Respiratory Societies. The Global Impact of Respiratory Disease–Second Edition. Sheffield: The European Respiratory Society, 2017.
  21. Piñeiro FM, López CT, de la Fuente Aguado J. Management of lung cancer in the COVID-19 pandemic: a review. *J Cancer Metastasis Treat* 2021;7:10.
  22. Lima-Martínez MM, Carrera Boada C, Madera-Silva MD, et al. COVID-19 and diabetes: A bidirectional relationship. *COVID-19 y diabetes mellitus: una relación bidireccional. Clin Investig Arterioscler* 2021;33:151-7.
  23. Hunt D, Hemmingsen B, Matzke A, et al. The WHO Global Diabetes Compact: a new initiative to support people living with diabetes. *Lancet Diabetes Endocrinol* 2021;9:325-7.
  24. Global Report on Diabetes World Health Organization 2016, Geneva, Switzerland
  25. Schraufnagel DE. Global Alliance against Chronic Respiratory Diseases symposium on air pollution: overview and highlights, *Chinese Medical Journal* 2020;133:1546-51.
  26. GARD webinar on CRDs in the COVID era on March 8th 2021. Available online: [www.GARD-breathefreely.org](http://www.GARD-breathefreely.org)

**Cite this article as:** Khaltaev N, Akselrod S. Role of Global Alliance against Chronic Respiratory Diseases (GARD) in achievement of the UN sustainable development goals (SDG) and targets. *J Thorac Dis* 2021;13(8):5117-5122. doi: 10.21037/jtd-21-857