

Global Burden of Disease (GBD): An Introduction

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ABSTRACT

The Global Burden of Disease (GBD) study is to provide a comprehensive picture of mortality and disability across countries, time, age, and sex. Health loss is quantified from hundreds of diseases, injuries, and risk factors, so that health systems can be improved and disparities eliminated. The 2019 GBD data cum findings have provided new insights on underlying health before the COVID-19 pandemic, and quantifying the challenges against further pandemic threats. Public health systems are said to be failing to stem the effects of risk factors, which accounts for almost half the healthy years of life lost around the world. The paper delves into global burden of disease, challenges and proffers the way forward.

KEYWORDS: *Burden of disease, risk factors, mortality, morbidity, hospice, palliative care, COVID-19*

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INTRODUCTION

Global burden of disease (GBD) is used by experts to know the number of people dying prematurely due to particular diseases as well the number of years spent by them in a state of disability due to various diseases. About 20% of the GBD is borne by India. Assessing health outcomes by both mortality and morbidity (the prevalent diseases) provides a more encompassing view on health outcomes. The sum total of mortality and morbidity is known as the “burden of disease” and measured by the metric called “Disability Adjusted Life Years” (DALYs). DALYs measures lost health and are a standardized metric that allows for direct comparisons of disease burdens of different diseases across countries, between different populations, and over time. Conceptually, one DALY is the equivalent of losing one year in good health because of either premature death or disease or disability. One DALY represents one lost year of healthy life. The human potential which is lost as a result of poor health is immense, this is been quantified by the Global Burden of Disease (GBD) project [1].

HISTORY OF THE GLOBAL BURDEN OF DISEASE STUDY

The Global Burden of Disease (GBD) study started in 1990 as a single World Bank commissioned study that quantifies the health effects of more than 100 diseases and injuries for eight regions of the world giving estimates of morbidity and mortality from major diseases, injuries and risk factors to health at global, national and regional levels by age, sex, and region [2].

GBD IN THE 1990s:

In the early 1990s, the World Bank commissioned the original GBD study which was featured in the landmark World Development Report 1993: Investing in Health. This was co-authored by Dr. Christopher Murray, who became the Director of the Institute for Health Metrics and Evaluation (IHME), this GBD study served as the most comprehensive effort to that point to systematically measure the world’s health problems, generating estimates for 107 diseases and 483 sequelae (nonfatal health consequences related to a disease). This covered eight regions and five age groups with estimates through 1990. The study had a great impact on health policy and agenda-setting

throughout the world, especially as it brought global attention to otherwise hidden or neglected health challenges, like mental illness and the burden of road injuries. The World Health Organization (WHO) has already institutionalized the work of GBD, and has created a Disease Burden Unit, which generated GBD estimates for 2000, 2001, and 2003, publishing the estimates in WHO's annual World Health Reports.

GBD 2010:

The policy report, *The Global Burden of Disease: Generating Evidence, Guiding Policy*, summarizes the GBD 2010 methods and results.

GBD 2013

With IHME as the coordinating center for an international network of GBD contributors, GBD 2013 expanded the methodology, datasets, and tools used in GBD 2010 and presented estimates for more than 300 diseases and injuries, 79 risk factors, and over 2,300 sequelae for 188 countries. The GBD 2013 findings were published in a series of papers.

GBD 2015

The GBD 2015 marked the first year of production of annual updates of the entire time series updates of GBD estimates, providing policymakers, donors, and other decision-makers with the most timely and useful picture of population health. The 2015 update expanded the methodology, datasets, and tools used in GBD 2013 and introduced the Socio-demographic Index (SDI), a summary measure that identifies where countries or other geographies sit on the spectrum of development.

GBD 2016

The GBD 2016, was published in a special issue of *The Lancet* in September 2017 and included the second annual report on the Sustainable Development Goal (SDG) indicators. The study included 333 diseases and injuries, 84 risk factors, 23 age groups, estimated for a total of 774 locations, and was produced with the participation of 2,518 collaborators from 133 countries and three territories. The results from the articles focused on some specific topics.

GBD 2017

The GBD 2017 was published in November 2017, and provided for the first time an independent estimation of population, for each of 195 countries and territories and the globe, using a standardized, replicable approach, as well as a comprehensive update on fertility. GBD 2017 incorporated major data additions and improvements, and methodological refinements. Mortality and life expectancy estimates was extended back to 1950, and new causes added to the fatal and non-fatal cause lists, for a total of 359 diseases and injuries. Added was also a new risk

factor, bullying victimization, and 80 new risk-outcome pairs. Moreover, more SDG indicators are now examined, and forecasting methods were used to generate projections through 2030 and assess the pace of change needed to attain the SDGs.

GBD 2019

GBD 2019 which was published in October 2020, provided for the first time an independent estimation of population, for each of 204 countries and territories and the globe, using a standardized, replicable approach, as well as a comprehensive update on fertility and migration. Mortality and life expectancy estimates have expanded to a total of 990 locations at the most detailed level, and new causes have been added to the fatal and non-fatal cause list. Two new risk factors (high and low non-optimal temperatures) and 54 new risk-outcome pairs have also been added. Included in GBD 2019 estimates at the subnational level were the following five new countries Italy, Nigeria, Pakistan, the Philippines, and Poland [3].

Burden of disease summary: The estimates for over 200 diseases and injuries in Australia for 2023, 2018, 2015, 2011 and 2003 were provided by the Australian Burden of Disease Study. Burden of disease measures the impact of living with illness and injury and dying prematurely. The summary measure “disability adjusted life years” (or DALY) measures the years of healthy life lost from death and illness [4].

TOP 10 CAUSES OF DEATH AND DISABILITY

The latest data on the causes of death and disability globally is provided by WHO based on region and country, by sex, by age, and by income group. The estimates are produced using data from multiple sources, including national vital registration data, latest estimates from WHO technical programmes, United Nations partners and inter-agency groups, the Global Burden of Disease and other scientific studies. Before publishing, the GHE are reviewed by WHO Member States via consultation with national focal points and WHO country and regional offices. The top 10 global causes of death in 2019 were [5,6]:

1. Ischaemic heart disease
2. Stroke
3. Chronic obstructive pulmonary disease
4. Lower respiratory infections
5. Neonatal conditions
6. Tracheal, bronchus, lung cancers
7. Alzheimer disease and other dementias
8. Diarrhoeal diseases
9. Diabetes mellitus
10. Kidney diseases

While the top 10 global causes of disability-adjusted life years (DALYs) in 2019 were:

1. Neonatal conditions

2. Ischaemic heart disease
3. Stroke
4. Lower respiratory infections
5. Diarrhoeal diseases
6. Road injury
7. Chronic obstructive pulmonary disease
8. Diabetes mellitus
9. Tuberculosis
10. Congenital anomalies

INTERNATIONAL PALLIATIVE HEALTHCARE DEVELOPMENT

Globally, over 60 million of people die each year, many of who spend their last weeks and days suffering serious, but avoidable physical and psychological pain due to a lack of pain and palliative care services. Palliative healthcare should be considered an issue for the international development community, by which the use of Global Social Policy would gain the global health priority of achieving Universal Health Coverage. The presentation of palliative care as being economically beneficial is hereby encouraged. Allowing the presentation of palliative care as an important element of international development would attract new funding streams. A systematic review revealed the lack of “international evidence” for palliative care, particularly in low and middle income countries. An analysis of the national contexts from which palliative care has (and has not) developed showed that countries which have not developed palliative are likely to face significant challenges in the delivery of basic healthcare. This therefore, raises serious questions about how such countries can also integrate palliative care into their health systems.

Palliative care services is said to exist now in 136 of the 234 countries, with a significant gap between supply and demand for services. The prioritization by global health actors is the potential to significantly accelerate palliative care development, through global regulations, resolutions and financing. To this end, in 2014 the World Health Assembly passed a Resolution calling for national governments to integrate palliative care into health systems, as shown in Figure 1. However, although there are suggestions that access to palliative care should be a universal human right, the field remains under-theorised, underfinanced and underdeveloped [7].

Palliative care refers to relieving the symptoms of an incurable medical condition, which focuses on easing and improving overall quality of life. Unlike hospice with which people often associate with end-of-life care. Palliative care is beneficial to people of any age and at any stage of a serious illness. Some of the goals of palliative care (PC), hinges on the four pillars

of: pain relief and symptom control, emotional care, social care, and spiritual care [8, 9, 10]:

- To maximize the quality of life.
- To provide relief from pain and other physical symptoms.
- To provide psychosocial and spiritual care.
- To provide support to help the family during the patient’s illness and in their subsequent bereavement.

The International Association for Hospice and Palliative Care (IAHPC) after conducting a consensus process with over 400 participants from 86 countries, and after a series of discussions, rounds, and rankings, the participants agreed that palliative care can be defined as the active holistic care of individuals across all ages with serious health-related suffering due to severe illness, and especially of those near the end of life. It also aims to improve the quality of life of patients, families, and their caregivers.

Palliative care (PC) is considered as a holistic care for people with life limiting conditions, including children, facing life-threatening illness – which if identified early can prevent and relief their sufferings and pains. The early delivery of palliative care will also reduce unnecessary hospital admissions and the use of health services. As a result of the ageing of populations and the rising burden of noncommunicable diseases and some communicable diseases, the global need for palliative care will increase. There is also the need for adequate national policies, programmes, resources, and training on palliative care among health professionals in order to improve access, since currently worldwide only about 14% of people receive it. It is known that each year an estimated 56.8 million people, including 25.7 million in the last year of life, are in need of palliative care [11]. Hospice care is the type of health care that focuses on palliation of a terminally ill patient’s pain and symptoms as well as attending to their emotional and spiritual needs at the end of life – its emphasis is on comfort and quality of life by reducing pain and suffering, as shown in Figure 2. The 7 C’s of palliative care are [12]:

- Communication
- Co-ordination
- Control of symptoms
- Continuity
- Continued Learning
- Career Support
- Care in the Dying Phase

The principles underlying PC are as follows [13, 14]:
Principle 1: Care is patient, family and carer centered – ensuring that they be actively involved in all the

aspects of care, including care planning and setting holistic goals of care. In this case, the patients, family and carers are “partners” in the decision making regarding the provision of their healthcare.

Principle 2: Care provided is based on assessed need – this ensures that every patient, family and carer gets access to care that is individualized based on their goals, wishes and circumstances.

Principle 3: Patients, families and carers have access to local and networked services to meet their needs, meaning that people would have access to high quality services and supports required to meet their needs, wishes and circumstances.

Principle 4: Care is evidence-based, clinically and culturally safe and effective – meaning that patients, families and carers would not experience negative consequences.

Principle 5: Care is integrated and coordinated – which is the approach that aims at delivering seamless care within the healthcare system and its interface with social care. This places people at the centre of care, providing comprehensive wraparound support for individuals with complex needs and enabling people to access care when and where they need it.

Principle 6: Care is equitable – this means that patients, families and carers would have equal access to available care for equal need; equal utilization for equal need and equal quality for all.

PALLIATIVE CARE PROVIDERS

Palliative care teams are: medical providers and other specialists that can help to manage symptoms. They help social, to navigate the stress and responsibilities that goes along with serious illnesses. The care team include: doctors, nurses, social workers, nutritionists, financial advisors, and spiritual advisors (chaplains).

PALLIATIVE CARE ACCESSIBILITY

How accessible PC is will depend on the availability of resources in your area, where such locations are: home, assisted living facility, nursing home, outpatient clinic, and hospital.

Some of the supports provided by PC would include: supplements your medical care; helps to provide social, emotional and spiritual support, takes care of health costs and legal planning, PC team can deliver care directly, and can teach you strategies to use every day to feel better, or can refer you to specialists if one needs additional care. They can also weigh treatment options/type of treatment to pursue, because the more informed you are, the more you can make care decisions that aligns with your values, goals and preferences. PC specialists could as well help build a support network to cope with illness easily by the

patient and the care giver [15], as shown in Figures 3 and 4.

Coronavirus disease 2019 (COVID-19) which emerged in Wuhan, China seriously affected Italy as the first Western country, but with delay in other European countries. However, high numbers of deaths were reported in USA and Brazil, and with expected increase in many developing countries. Consequently, governments adopted severe measures of social distancing, in some countries like Italy there was complete lockdown, and while uncontrollable events with numerous people are forbidden e. g. in theaters, stadium, congresses. In the COVID-19 crisis, the early involvement of palliative physicians could have improved communication with caregivers, who were completely excluded for the risk of contagion, but could have helped any decision-making process for withdrawing, withholding, or intensification of the treatments, for which many deaths could have been avoided [16].

CHALLENGES FACING PALLIATIVE CARE (PC)

Some of the challenges or obstacles confronting palliative care are: political, financial, lack of understanding and training in the palliative care approach. As with other models of health care, HIV brought its own particular challenges to the concept and implementation of palliative care. Palliative care for people with HIV or for others with chronic illnesses, is an essential part of any health care system. The WHO identified three foundation measures to scaling up the provision of such care [17]:

1. Development of a national policy: In many countries, PC is not recognized by many government plans. The only sub-Saharan African country that has adopted WHO’s foundation measure for establishing a PC service is Uganda. The advocacy for the provision of PC as part of the essential health service system of the government will involve some budget allocation for provision of care for those with chronic illnesses.
2. Training for health workers and public education: There is the need for the understanding of what PC is all about, and the training of the staff to carry it out, public education for policy makers, health professionals and families. In the care of HIV for instance, such training should be linked to training on areas specific to HIV such as transmission and control of transmission, issues of stigma and discrimination, and respect for confidentiality.

3. Pain control: this is very important in HIV infection and also as in cancer. Studies have shown that pain is a primary symptom by more than half of the people with HIV. This will therefore require training and awareness among health professionals, and advocacy to change laws to make effective pain relief available.

Other challenges include: Personal challenges due to knowledge, attitudes, beliefs, skills, culture of patients and families, the general public and Healthcare professionals (HCPs). Another is health care system challenges i.e. in terms of workforce development issues, education, service delivery, and access issues across organizations. The most critical barrier to the provision of PC is the shortage or inadequately trained PC workforce, shortage of nursing staff, and specialized ancillary personnel. There is also lack of professional training programmes for HCPs cum little collaboration/partnership between health organizations. In addition is the restriction of drugs/inadequate access to essential pain-relief medicines/cumbersome drug importation processes [18, 19, 20].

Policy/payment challenges: Reported is the shortage or lack of funding as a critical barrier to the provision of PC, and the lack of a comprehensive national PC plan, inadequate or inappropriate legislation and policy [21, 22]. Cultural and social barriers, such as beliefs about death and dying, misconceptions that PC is only for patients with cancer or for the last weeks of life, and the misconceptions that improving access to opioid analgesia will lead to increased substance abuse [23].

WAY FORWARD FOR PALLIATIVE CARE

The prevalence of chronic and life-limiting illnesses is bound to increase as the population ages, therefore, nations are to develop a system of community-integrated palliative care. The early involvement of palliative care providers will help improve quality of life and reduce suffering. Quality hospice palliative and end-of-life care should be an integral part of healthcare, and made available in all settings of care including hospital, long-term/continuing care, residential hospices, shelters and individual homes. Palliative care is well identified, accessed and integrated as a goal by leaders across Canada, known as the Palliative Care Coalition of Canada (PCCC) [24].

Health workforce need: Over 56 million people are known to be in dire need of palliative care globally will require great increase in the professional and para-professional workforce trained in basic or primary palliative care.

Putting in place the minimum package of palliative care services as proposed by the Lancet Commission on Palliative Care & Pain Relief will include human resources, medicines, and equipment [25].

CONCLUSION

Palliative care should be integrated into the main health system by all governments at all levels to make health care accessible to all. Professionals of all cadres in the palliative care system must be well trained and adequately remunerated. In developing or third world countries, corruption must be fought as this would be a source to embezzle public funds earmarked for providing affordable/free health services for people by the politicians. This should be in the form of a trust fund, to be under the watch or control of reputable men/women of integrity. International clinical PC experts are of the consensus that morphine, midazolam, haloperidol, and antimuscarinic drugs should be made available in all settings in which patients are cared for in the last days of life.

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Figure 1. Caregiver - Wikipedia

Source:https://www.google.com/search?q=+palliative+care+by+wikipedia&tbm=isch&ved=2ahUKEwib9qjZqZeEAXU2daQEhdkBvwQ2cCegQIABAA&oq=+palliative+care+by+wikipedia&gs_l=EpNpbWciHSBwYwXsaWF0aXZlIGNhcmUgYnkgd2lraXBIZGlhSM1YUKQPWPUncAB4AJABAjgBzw6gAeEoqgELMi02LjIuMi44LTG4AQzIAQD4AQGKAgtnd3Mtd2l6LWltZ4gGAQ&sclient=img&ei=XfCZduVHLbqkdUP2f2Y4A8&bih=580&biw=1366#imgcr=arWsETW4aEWaW



Figure 2. Hospice - Wikipedia

Source:https://www.google.com/search?q=pillars+of+palliative+care+by+wikipedia&tbm=isch&ved=2ahUKewieI6HqZeEaxVxVKQEHQo0C0kQ2cCegQIABAA&oq=pillars+of+palliative+care+by+wikipedia&gs_l=lp=EgNpbWciJ3BpbGxhcnMgb2YgcGFsbGlhdGl2ZSBjYXJlIGJ5IHdpa2lwZWVpYUgAUABYAHAAeACQAQCYAQCgAQCqAQC4AQzIAQCKAgnd3Mtd2l6LWltZw&sclient=img&ei=TXfCZd6wJPGokdUPiuisyAQ&bih=580&biw=1366#imgrc=BFFiDsJKC8yu2M

Figure 3. Philosophy of healthcare - Wikipedia

Source:https://www.google.com/search?q=pillars+of+palliative+care+by+wikipedia&tbm=isch&ved=2ahUKewieI6HqZeEaxVxVKQEHQo0C0kQ2cCegQIABAA&oq=pillars+of+palliative+care+by+wikipedia&gs_l=lp=EgNpbWciJ3BpbGxhcnMgb2YgcGFsbGlhdGl2ZSBjYXJlIGJ5IHdpa2lwZWVpYUgAUABYAHAAeACQAQCYAQCgAQCqAQC4AQzIAQCKAgnd3Mtd2l6LWltZw&sclient=img&ei=TXfCZd6wJPGokdUPiuisyAQ&bih=580&biw=1366#imgrc=9Uxl4R4daGXn1M

Figure 4. Patient safety - Wikipedia

Source:https://www.google.com/search?q=pillars+of+palliative+care+by+wikipedia&tbm=isch&ved=2ahUKewie6HqZeEaxVxVKQEHQo0C0kQ2cCegQIABAA&oq=pillars+of+palliative+care+by+wikipedia&gs_l=lp=EgNpbWciJ3BpbGxhcnMgb2YgcGFsbGlhdGl2ZSBjYXJlIGJ5IHdpa2lwZWVpYUgAUABYAHAAeACQAQCYAQCgAQCqAQC4AQzIAQCKAgtd3Mtd2l6LWltZw&sclient=img&ei=TXfCZd6wJPGokdUPiuisyAQ&bih=580&biw=1366#imgrc=bu3eeNoJgbbqKM