



Research Article

Simulated assessment of global healthcare burden in post Covid-19 pandemic era

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Abstract

Aim: World is observing worst public health catastrophe from the Covid-19 Pandemic. There is several health disorder manifestations affecting both infected and uninfected population on an unprecedented scale creating additional healthcare burden. Healthcare cost has gone through the roof on account of new treatment protocol measures. Efforts have been made to visualize healthcare burden in post pandemic era through simulation techniques.

Method: The study is primarily is based on data generated by Johns Hopkins Coronavirus Resource Centre, media reports and clinical observations over last eight months. Stochastic simulation techniques are used for estimation of probable future trend in healthcare burden post pandemic

Results: It is difficult to quantify global healthcare burden on account of various kind of health disorders that are already visible and expected to spike after total control of the pandemic. Stochastic simulation projected healthcare burden at about \$3.6 trillion on global scale during first year post pandemic.

Conclusions: In view of mammoth healthcare burden, the national governments need to devise new healthcare policies to address various challenges in post pandemic era due to paradigm shift in healthcare and overhaul healthcare system to save their natives from another catastrophe especially the lower socioeconomic population.

Keywords: Covid-19 pandemic; Post-pandemic healthcare burden; Non-communicable diseases

Aim

World is observing worst public health catastrophe from the Covid-19 Pandemic. There is several health disorder manifestations affecting both infected and uninfected population on an unprecedented scale creating additional healthcare burden. Healthcare cost has gone through the roof on account of new treatment protocol measures. Efforts have been made to visualize healthcare burden in post pandemic era through simulation techniques.

Background

Present SARS-CoV-2 (Covid-19) pandemic has inflicted colossal hardship on global population primarily in terms of untimely deaths of near and dear ones including breadwinners, huge financial losses, and subsequent fallout healthcare burden in terms of other manifested morbidity. According to the Johns Hopkins Coronavirus Resource Center data, the pandemic has caused over 23.6 million cases and 814,216 deaths globally [1]. India reportedly had more than 3.1 million cases with death toll of 58,317 at the time of writing on August 24, 2020. Healthcare experts and World Health Organization (WHO) have declared that the virus is going to stay and all have to learn live with it, a very draconian prophesy. Unlike

earlier epidemics, Covid-19 pandemic is likely to make paradigm shift in living protocol for next several years.

Elderly population above 60 years with comorbidity like cardiovascular diseases, hypertension, diabetes, renal and mental history are comparatively fall in higher risk category. Stretched isolation and lockdowns resulted in separation from aged parents and children and vice versa have caused elevated anxiety levels, leading to onset of many non-communicable health disorders including suicides [2]. Heavy financial losses to horticulture and agriculture farm producers, micro-small-medium businessmen, and layoffs of workforce are some of instances that aggravated healthcare burden. Reported spikes in suicides by individual and families for want of money and uncertain future including that of 54 year old Thomas Schäfer, German finance minister, are causes of serious concern. Spurt in clinical manifestation of several non-communicable health disorders of unknown origin like mild to severe abdominal pain, hypo- and hypertension, disturbed sleep, myalgia, convulsions, mental disorders like compulsive obsessive disorder (COD), prolonged constipation, GI disorders, skin disorders like stress rashes and allergy, and many more are being reported from all over the world.

Aggravation of many predisposed health disorders is also being reported.

Ensuing complete lockdowns (four in India from March 24 till May 31, 2020 and thereafter limited opening) over months and thereafter containment zones resulted in higher levels of anxiety all over. Elevated levels of anxiety known to create imbalance in brain chemicals such as serotonin, dopamine, and gamma-aminobutyric acid (GABA); serotonin regulates various body functions and emotions including sleep and appetite and its imbalance causes several types of health disorders. In this medical emergency and lockdown, telemedicine is proving to be handy tool and gave a fairly good picture of fallouts during pandemic and expected post pandemic aftershocks.

Method

The study is primarily based on data generated by Johns Hopkins Coronavirus Resource Centre,¹ media reports and clinical observations over last five months. Stochastic simulation techniques are used for estimation of probable future trend in healthcare burden. Four scenarios emerged in this global medical emergency:

- (a) Direct healthcare burden
- (b) Indirect healthcare burden
- (c) Burden due to delay in healthcare
- (d) Psychological disorder burden

(a) Direct healthcare burden: It is arising on account of direct SARS-CoV-2 virus infection affecting various organs (besides lungs) like brain, heart, liver, and kidneys and manifesting into various temporary or permanent morbidity and comorbidity.

(b) Indirect healthcare burden: Uninfected by virus but patients suffering from predisposed morbidity are likely to have huge healthcare burden on account of aggravation caused by interruption of regular healthcare due to unavailability of timely medical consultations, particular medicines and complications arising from disruptions in follow-up of surgeries conducted just before onset of pandemic lockouts. Inadequate treatment rendered in absence of availability of exact medicines.

(c) Burden due to delay in healthcare: Delay in elective surgeries and treatment of other predisposed diseases. Disruption of vaccination schedule for newborns.

(d) Psychological disorder burden: This is one of healthcare burdens that cannot be ignored. There are increasing reports of relapses of patients suffering from compulsive obsessive disorder (COD) syndrome. Distress and anxiety is also caused by constant fear of being an asymptomatic carrier of virus and possible relapse of symptomatic patients. Fear of poor performance of school going children due to long closures of schools and possibility of infection of child in school is another cause of anxiety. Work from home is also causing anxiety and depression.

Results

The simulation projected little over 30 percent of global adult population and about 10 percent of child population needing medical care in some form or the other in post pandemic era. Table-1 exhibits healthcare burden in post pandemic era.

Table1: Assessment of healthcare burden in first year post Pandemic

Parameters	World Population ³	Indian Population ³
Total	7.8 billion	1.38 billion
Adult	5.9 billion	1.01 billion
Children	1.9 billion	0.37 billion
30% of adult population (a)	1.8 billion	0.30 billion
20% of child population (<15 years) (b)	0.4 billion	0.07
Population needing healthcare: (a) + (b)	2.2 billion	0.37
No. of consultation per year	5-10	5-10
Consultation fee per patient per visit	\$50-200 (Global average)	\$10-20
Consultation fee in one year	\$250	\$50
Lab tests	\$400	\$200
Medicines	\$1000	\$200
Total expenses per year per patient	\$1650	\$450
Total healthcare burden in first year post pandemic	\$3.6 trillion	166.5 billion

Discussions

SARS-CoV-2 pandemic has created new social normal that is posing serious challenges to healthcare professional all over the world. Number of calls to mental, general practitioners (GP) and specialists has multiplied 3-6 folds after lockdowns which are going exponential with increasing number of lockdown days.

Healthcare cost has gone through the roof due to new treatment protocol measures involving additional cost towards personal protective equipment (PPE) and extra sanitization measures to be borne by patients and is not covered by the health insurance. In India, a Covid-19 treatment expenses surpassed open heart surgery or organ transplant surgery. Moreover, delivery of healthcare has gone in shambles. Hospitals are refusing to provide treatment even to uninfected emergency patients for unfounded fear of infection and patients are dying unattended sometimes at the door steps of the hospitals [4].

It is difficult to quantify global burden on account of various kinds of health disorders that are expected to spike during and after total control of the pandemic but it is expected to be huge. Stochastic simulation projected that about 30 percent of adult global population and 10 percent of children will require medical attention at least for a year or two in post pandemic times; these numbers include Covid-19 infected population (both symptomatic and asymptomatic) and pandemic induced non-communicable morbidity. Considering most conservative inputs the probable global healthcare burden stands at whopping \$3.6 trillion globally (\$166.5 billion for India) in the following first year post pandemic. If we consider only one-third population of the stochastic projections that will need medical attention in post pandemic even then the total healthcare burden works out to be \$1.2 trillion (\$55.5 billion for India). Healthcare burden

will further explode if PPE becomes the order of the day for medical consultations making paradigm shift from traditional healthcare. PPE protocol is likely to stay at least for a year or two or even more after the cooling down of pandemic. Increase in healthcare insurance premium is bound to increase to cover new treatment protocols thereby adding overall healthcare burden of the state or the individual.

Conclusions

World over healthcare systems fell short to provide expected services in time of global medical emergency. In view of mammoth healthcare burden, the national governments need to devise new healthcare policies to address various challenges in post pandemic era due to paradigm shift in healthcare thereby overhauling the entire healthcare system.. They also have to devise new healthcare policies to address various challenges in the post pandemic era due to paradigm shifts in healthcare protocols to save respective natives especially the lower socioeconomic population from another catastrophe.

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