

Summary of Yojana

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Theme: Universal Health

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COVID-19: The Novel Threat

What are Viruses?

- Viruses are on the borderline of living and dead beings. They are much tinier than bacteria. Their size ranges from 18nm-400nm, they do not grow on routine laboratory media.
- Because of this, specific laboratory diagnosis of viral infections is not easy. Viruses are host cell-dependent particles, they use host cell machinery to build their structure.
- That is why, specific antiviral drugs which don't damage host cells are very limited. Mutations occur during every viral infection, either spontaneously or may be induced with chemicals or physical agents.
- A hybrid or recombinant virus will have new genes and new characteristics as well.

Corona Viruses

- All Coronaviruses are large (120-160 nm) enveloped RNA viruses which have single stranded genome. The name "coronavirus" is derived from Latin corona, meaning "crown" or "wreath".
- The virus possesses a club shaped or crown like peplomer spikes giving appearance of solar corona. High rates of genetic mutations are shown by the corona viruses. Most of these infect animals and birds. Human infection is caused by only those which can adapt to human conditions.
- There are already known six corona viruses involved in human infections. Most of them are widespread, affecting people of most parts of the world and are known to produce mild upper respiratory tract infection and occasional diarrhea.
- In 2003 there was an outbreak of SARS-CoV (Severe Acute Respiratory Syndrome coronavirus). It originated from China and spread to around 29 countries causing 8098 cases and 774 deaths. The source was believed to be monkeys, raccoon dogs, cats and rodents.
- Another member of corona viruses, MERS-Cov (Middle East Respiratory Syndrome coronavirus) emerged in 2012. First reported from Saudi Arabia, MERS-CoV has affected more than 2143 cases and 750 deaths from 27 different countries. Here, the source was thought to be camels and bats.

COVID 19

- This is the latest terminology being used as per the WHO guidelines. It represents **CO**rona **V**irus **D**isease originated in 2019.
- Previously used names for COVID 19 are:



- SARS-CoV-2
 - 2019-nCoV acute respiratory disease
 - Novel coronavirus pneumonia
 - Wuhan pneumonia
- First case of this virus was identified in December 2019 from Wuhan, Hubei province of China.
 - WHO declared the 2019-20 coronavirus outbreak, a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 and a pandemic on 11 March 2020.

Challenges due to COVID 19

- It is novel virus, very little is known about it. That's why currently the treatment being given is not very specific. Some antivirals, some anti-parasitic drugs are being tried. It is a highly contagious disease.
- The transmission rate of SARS-CoV-2 is higher than SARS-CoV and the reason could be genetic recombination. Asymptomatic carriers as well as convalescent individuals can transmit the virus.
- No age group is spared. The progression of the disease is very unpredictable. Mortality rates are very high in some parts of the world compared to others.

Transmission

- There are two main routes of transmission of the COVID-19 virus: respiratory and contact. The virus is mainly spread by small droplets produced by coughing, sneezing or even talking to an infected person.
- These droplets may also be produced during breathing; however, since the virus is large (as compared to other viruses), they rapidly fall to the ground or surfaces and are not generally spread through the air, over large distances.
- People may also become infected by touching a contaminated surface and then their face. The virus can survive on surfaces for a few hours to a few days, depending upon the nature of surface.
- It is most contagious during the first three days after onset of symptoms. Spread is possible before symptoms appear and in later stages of the disease as well. That makes it more dangerous.
- The time from exposure to onset of symptoms is typically around five days, but may range from two to fourteen days. There have been no reports of fecal-oral transmission of the COVID-19 virus.

Clinical Outcome

- Common symptoms include fever, cough (mostly dry cough) and shortness of breath. Other symptoms may include fatigue, muscle pain, diarrhea, sore throat, loss of smell and abdominal pain.
- While the majority of cases result in mild symptoms (about 80%), some progress to viral pneumonia and multi-organ failure. Older people and people with other medical conditions (such as asthma, diabetes,



hypertension or heart disease), are more vulnerable to becoming severely ill. Severity also depends on pollution levels in that area.

- Mortality rates vary in different age groups, highest being 80+. Some survivors show permanent lung damage. Unfortunately, corona virus infections produce short and brief immunity, leaving a chance of reinfection.

Diagnosis

- Early diagnosis proves beneficial in stopping further dissemination, as infected individuals are the only source of infection to others. Absence of specific symptoms makes the clinical diagnosis difficult.
- Laboratory testing is essential for confirmation. Real-time reverse transcriptase PCR (rRT-PCR) testing is the most useful test and currently the only reliable one.
- Blood antibody testing and viral antigen testing methods are being tried but are not specific.

Treatment

- Currently, there is no uniform policy for treatment. Several drugs such as chloroquine, Hydroxychloroquine, arbidol, remdesivir, and favipiravir are undergoing clinical studies to test their efficacy and safety in the treatment. Right now, no vaccine is available for COVID-19.
- Major problem with vaccine production is the genetic alterations which the virus undergoes. In the initial phase of the disease where symptoms are mild, it can be treated by supportive therapy.
- In case of major lung damage, ventilator support might be required. Good immunity of individual may prevent further complications.
- In a recent study, it was identified that monoclonal antibody (CR3022) binds with the spike RBD of SARS-CoV-2, a structure essential for attachment of virus to the host cells.
- Monoclonal antibodies can be developed as a therapeutic candidate, alone or in combination with other neutralizing antibodies for the prevention and treatment of COVID-19 infection. Further studies are going on.
- At this point of time, prevention is the best possible treatment.

Personal Preventive Measures in public places

- Staying home
- Covering mouth and nose with flexed elbow or tissue when coughing or sneezing
- Disposal of used tissue immediately



- Systemic washing of hands often with soap and water for at least 20 seconds OR using a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry
- Avoid touching your eyes, nose and mouth with unwashed hands
- Cleaning frequently touched surfaces and objects

Preventive Measures in Public Places

- Keep about 6 feet distance with others
- Wear a cloth face cover/mask. Do not use a facemask meant for a healthcare worker
- Clean and disinfect frequently touched surfaces daily. This includes tables, doorknobs, lift handles, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets and sinks.
- To disinfect- Most common household disinfectants like bleach solution will work. Use disinfectants appropriate for the surface.
- Effective inactivation could be achieved within 1 minute using common disinfectants, such as 70% ethanol or sodium hypochlorite
- There is no evidence about the survival of the COVID-19 virus in drinking-water or sewage, so any special treatment of water is not required.

Conclusion

- How far this pandemic of COVID 19 damages us is solely in our hands.
- If we follow personal and social behavioral discipline, then the damage can be minimized.
- But if we ignore it, then it will prove to be the most catastrophic event in the history of the globe. So let's save ourselves and our globe.

Yoga for Stress Management

What is COVID-19?

- The clinical features from chest CT of patients with COVID-19 include: pneumonia, acute respiratory distress syndrome, acute cardiac injury and ground glass opacities.
- People with co-morbidities such as diabetes, hypertension and other cardio-vascular disorders appear to be more susceptible than the rest.

Stress and Immunity



- Considering the rapid spread and its impact on individual's health, the World Health Organisation has declared COVID-19 as a global pandemic.
- Stress is fight or flight response to a demanding situation. There is increased fear, stress and apprehension among society due to the mortality and morbidity resulting from this pandemic.
- Immunity and lifestyle factors are closely interlinked. A meta-analysis of 300 studies concluded that chronic stressors reduce both cell mediated and humoral immunity of the host.
- It means that when we are under stressful demanding situations our immune system starts getting compromised and we become prone to infections.
- Thus, an intervention such as yoga which reduces psychological stress may have an important role to play in strengthening the immune system thereby reducing spread of infections and preventing complications.

Introduction to Lifestyle

- Yoga-based lifestyle involves lifestyle modification based on the concepts of right living from Indian ancient scriptures.
- According to yoga principles, there are four components of the lifestyle namely- diet, physical activity, habits and emotional well-being. Irregularity of these lifestyle factors is considered as a major cause which affects the integrity of the immune system and increases the risk for infections.
- The lack of adherence to proper lifestyle (junk food consumption, physical inactivity, improper sleep-wake cycle, addictions) is all traceable to the speed of thought patterns in the mind.
- Hence, the entire concept of yoga-based lifestyle is to reduce the speed of mind (by the practices of physical postures with mindfulness, breath regulation, chantings, and relaxation techniques) and thus, manage it efficiently so that the individual is able to adhere to a proper lifestyle.
- Calming down of the mind provides deep rest and rejuvenation to the system which enhances homeostasis and immunity.

Tentative Yoga Module for Stress Management and Control of COVID-19

- Consistent practice of yogic breathing techniques (pranayama) increases the lung's airflow, air capacity, stamina and efficiency.
- A study assessed blood oxygen saturation before, during and after two yoga breathing techniques; high frequency yoga breathing (Kapalabhati) and breath awareness in 29 healthy young male volunteers.
- They observed a significant increase in oxygen saturation during the 33 min session of high frequency yoga breathing.
- Another study compared oxygen consumption during the short kumbhaka (timed breath holding) varieties of Ujjayi pranayama, and the other long kumbhaka varieties of Ujjayi pranayama in ten healthy volunteers.



- The duration of kumbhaka phase was on an average 22.2% of the respiratory cycle in the short kumbhaka group, and 50.4% in the long kumbhaka group.
- It was observed that short kumbhakapranayamic breathing caused a statistically significant increase (52%) in the oxygen consumption (and metabolic rate) compared to the pre-pranayamic baseline period of breathing.
- In contrast to the above, the long kumbhaka pranayamic breathing caused a statistically significant lowering of the oxygen consumption (by 19%) and metabolic rate).
- Another yogic breathing technique called Sudarshan kriya (SK), which involves breathing in three different rhythms (including Ujjayi and Bhastrika practices), has been shown to lower blood lactate levels, provide better antioxidant defence and improve Natural Killer (NK) cell counts.
- Yoga-based breathing practices have been reported to improve gas exchange in patients with chronic heart failure and in participants exposed to high-altitude hypoxia, it has also been used for increasing oxygenation in patients suffering from chronic obstructive pulmonary diseases.
- Another study found that oscillating airflow produced by humming bee breath (Bhramari pranayama) enhanced sinus ventilation and thereby increased nasal nitric oxide levels (by 15-fold) in ten healthy subjects.
- A recent study on the effect of yoga in patients with HIV has demonstrated that regular practice of integrated yoga (joint loosening, sun salutations, breathing practices, pranayama and relaxation techniques) for a month could boost immunity and psychological health.
- Yoga had been beneficial as an adjunct to anti tuberculosis treatment in pulmonary tuberculosis patients by reducing the symptom scores, sputum conversion on microscopy, improvement in lung capacity and radiographic pictures.
- Apart from this, yoga may also help manage the risk factors such as type 2 diabetes, hypertension and heart diseases.
- These evidences highlight the possible role of yoga in preventing infection, controlling virulence of the pathogen and improving symptoms in the infected individual suggesting its application to the present pandemic.

Strengthening Health System

- India has successfully eliminated diseases like small pox, guineaworm, neonatal tetanus and polio, and effectively controlled many communicable diseases like leprosy, malaria, filariasis, kala-azar and progressing well towards ending tuberculosis by 2025.



- Deaths due to infectious and communicable diseases have also been significantly reduced.
- The challenge is to overcome the growing incidence of non-communicable and lifestyle diseases like cancer, diabetes, chronic kidney diseases, cardiovascular diseases, chronic lung diseases and mental health disorders etc., as well as to achieve the universal health coverage with indigenous, affordable and cost-effective innovations.
- Changing lifestyle and risk of behavior like smoking, alcohol consumption, unhealthy diet and inadequate physical activity are attributed to high Non-Communicable Disease (NCD) burden. Increasing proportion of ageing population due to concurrent demographic transition has further contributed to NCD burden.
- NCDs account for 55.4% of the diseases burden and 62% of death in India and is expected to rise further to over 70%.
- The approaches for reducing NCD mortality and morbidity are very different than India's health system had been implementing for prevention and control of communicable diseases, and strategies for reducing maternal and child mortality.
- While the emerging new challenge of NCDs and the challenge of fighting malnutrition and communicable disease still continue, India is facing double disease burden.
- India has largely achieved Millennium Development Goals (MDGs) and is committed to Universal Health Coverage (UHC) which is one of the targets of Sustainable Development Goals (SDG) by 2030.
- The SDG 3 targets to achieve UHC, including financial risk protection, access to quality essential health care services, and access to safe, effective, quality and affordable essential medicines and vaccines for all.

Health Financing in India

- To address the entire game of disease burden, the public expenditure on health accounts for nearly one-third of the total expenditure at 1.2% of the GDP and remaining is met by Out-of-Pocket expenditure (OOPE) by the households which is exorbitant and puts extra pressure on low socio-economic population as almost 10 crore population goes below poverty line due to high OOPE.
- According to the latest National Health Accounts Estimates (2016-2017), the total spending on health in India is 3.8% of the GDP which has reduced from 4.2% in 2004-05.
- The Government health spending has remained almost static around an average of 1% of GDP and the State health spending is around 2% of SGDP on average with variations across the States.
- The Total Health Expenditure (THE) per capita has increased more than three times from 2004-05 to 2016-17.
- Out of THE, 32.4% is Government Health Expenditure (GHE), 58.7% household as OOPE, 7.3% social security insurance and 4.7% private health insurance. The proportion of GHE has increased from 22.5% in



2004-05 to 32.4% in 2016-17. The external donors/funding accounted for 2.3% in 2004-05 has reduced to 0.6% in 2016-17.

- A sum of 45% of the total current health expenditure is spent on primary health care followed by 36% for secondary care, and 13.9% for tertiary care. 52% primary health care is supported by government as compared to primary sector (41%).
- The government share on secondary tertiary (10.8%) care is lower than the private sector (42.4% and 15.6% respectively).
- Among the providers of health care, the Government hospitals contribute to 14% of the current health expenditures, whereas the contribution of the private sector is significantly higher at 26%.
- Catastrophic health expenditures have increased significantly in both rural and urban areas. There is an indication of reduction of hardship financing over the 10 years as household's reliance on borrowing from money lenders, friends etc. to finance health care has declined steadily in both rural and urban areas.
- Households are now relying on income and savings to meet their healthcare expenses.

What is the Rationale for Spending on Health, especially Public Health?

“Sarvebhavantusukhinah, sarvesantuniramaya”

- It is widely acknowledged that health is not only a goal in itself, but also vital for improved developmental outcomes.
- It is known that better health improves productivity and reduces loss due to premature deaths, prolonged disability and early retirement.
- Health and nutrition also directly impact the scholastic achievements which have bearing on productivity and income.
- Government health spending in India was 30% in 2014 which is 2.8 times and 1.9 times lower than Japan and China.
- In 2014, India spent 5% of total government expenditure on health which is less than half of China, less than one-third of UK and Denmark.
- India's tax collection to GDP in 2015 was 16.6%, much lower than China, UK and Denmark. Thus, already India needs to expand its tax base and specific tax and cess for the social sector.
- Public health care system in India needs to address the issue of critical regulation systems on food, drugs and diagnostic etc; life saving vaccines and drugs like TB; preventive, promotive, palliative and rehabilitative health care; implementation of clinical establishment rules; gaps in medical, dental, nursing and pharmacy institutions which will not be addressed by market forces requires government interventions.
- The private market will not address inequity of healthcare can potentially deal with 90% of healthcare demands. Investment in primary healthcare including prevention and health promotion proves better health



& developmental outcomes at a much lower cost – it helps to reduce the need for more costly, complex care by preventing illness and promoting general health.

- There is global evidence that primary health care is critical to improving health outcomes. It plays an improvement role in prevention of several disease conditions, including non-communicable diseases.
- Comprehensive primary health care reduces morbidity and mortality at much lower costs and significantly reduces the need for secondary and tertiary care. It also addresses preventive, promotive curative rehabilitative and palliative aspects of care.

Time for “More Health for Money”

- Studies have indicated that the health sector in India is facing shortage of infrastructure and manpower especially specialists. It is a right time to use the power of technology in the re-organisation of healthcare and evolve a new class of care delivery models.
- The Indian health care system has a huge growth potential; initiations such as liability gap funding for setting up hospitals under PPP mode in aspirational districts offer an opportunity to innovate limited health allocation; will push the sector “to do more with less” adopting innovations and replicating existing best practices.
- Proceeds from tax on medical devices to be used for funding government hospitals; converting existing district hospitals; converting existing district hospitals to medical colleges through PPP mode and attaching a medical college with district hospital in the PPP mode are some innovations in Union Budget 2020-21 to address the shortage of doctors and infrastructure.
- Health cess of about 1% on direct tax, raising funds of approximately Rs. 10,000 each year need to be diverted to health. There is a need to develop partnership with the private health sector for co-financing secondary and tertiary health care, and with the corporate sector for allocating CSR funds in health care.
- Health insurance to finance hospitalization to reduce OOPE and catastrophic health expenditure can also be introduced. Ayushman Bharat has a great promise but the coverage should be extended to the whole population. People contributing towards their annual premiums may also be thought of.
- A fairly large proportion of the allocated budget remains, unutilized within the health system on account of poor absorption capacity of States, delays in funds flows, inefficient implementation of activities and weak governance. Improving efficient budget utilization and health systems performance would make available massive unspent funds for all envisaged growth plans.
- Removing bottlenecks in allocation, disbursement and timely flow of funds would also enhance utilization of allocated funds.



Artificial Intelligence in Healthcare

With the ubiquitous reach of mobile technology within rural areas, opportunities exist for AI to help in the achievement of good health and well-being within remote communities where access to healthcare and skilled medical professionals are in short supply.

Opportunities and Applications

- The modern era of global connectivity and high levels of mobile usage in India presents significant opportunities for access to AI technology focused healthcare within the following areas:
 - **AI in Assistance to Physicians-** Given the resource constraints and stress on the healthcare system, a significant part of a doctor's workload could be safely offloaded to carefully-designed AI systems, reserving the serious cases for more detailed physicians's attention.
 - **AI in Diagnostics-** One of the key healthcare challenges in India is acute shortage of radiologists. AI based diagnosis can be especially helpful for radiology, pathology, skin diseases, and ophthalmology.
 - **AI for Optimising Treatment Plans-** AI can also be used for assisting doctors and patients to choose an optimal treatment protocol. Such technology is in use in India, China and Thailand to provide appropriate recommendation plans for cancer treatment using patient's details linked to medical literature.
 - **AI for Monitoring/Ensuring Compliance** - Devices can be used for helping people exercise and adopt healthy eating. While these aspects have largely been used for chronic disease management (diabetes, stroke, epilepsy) and for elderly people, specific aspects can also be designed for monitoring during epidemics.
 - **AI in the COVID-19 Epidemic** - The COVID-19 epidemic highlights the need for an AI based epidemic monitoring system that can model and predict outbreaks and help optimize scarce resources. AI can help fight the virus via Machine Learning-based applications including population screening, notifications of when to seek medical help and tracking how infection spreads across swathes of the population.
- **Challenges and Controversies**
 - **Healthcare Industry Issues** - Due to the nature of the industry as well as people dynamics, the healthcare industry has been slow to adopt technological innovations. The challenges of migrating to an AI-technology-based healthcare infrastructure are numerous as medical professionals attempt to transition to new ways of working and adopt new systems and processes. Traditional healthcare



personnel may resist new innovations, doctors may not trust AI system, patients may question AI-based decision-making and medical staff could view the changes as disenfranchising them from their key roles and decision-making powers. The required transformation to an AI-centric healthcare system requires trust from medical professionals, but also from patients unaccustomed to new ways of diagnosis and decision-making.

- **Technology-related Issues** - The challenge within India is the disparate nature of healthcare-related data. Each state has its own system and working process. Initiatives are needed at state and national government levels to ensure shared data standards, data security and exchange processes are incorporated within healthcare systems.
- **Socio-cultural Issues in Technology Implementation** - Although India is seeing significant development and positive societal change over the last decade or so, the country has a long road ahead in the context of nationwide technological development and adoption. Although, policy makers have tended to view successful ideas from other countries and naturally assume these can be transplanted to India, researches have warned of the inefficiency, ever danger of such an approach. Solution need to take account of the Indian context where pockets of the population are socially and educationally challenged, culturally marginalized and economically disadvantaged. Decision-makers need to ensure that public sector healthcare organisations benefit from AI technology rather than default to the private sector reaping the rewards for investment.
- **Regulatory and Ethical issues** - There are several ethical and regulatory challenges in implementation of AI in healthcare in India. Data security and privacy is especially important with the increasing use of wearables which can potentially cause identity theft through hacking of devices and data. AI is set to alter the traditional relationship between the doctor and the patient as technology plays the role of a third substantial actor. Under these circumstances, the regulators need to provide clear and concise user agreement and privacy policies to enhance widespread and safe adoption of these devices.

Recommendations

- To enhance the adoption of technology by healthcare providers, AI and its applications should be incorporated within the curriculum for medical and paramedical training.
- Technology should be recognized as socio-culturally embedded; hence the technology design and implementation should take into account cultural practices and address the gender divide in India.
- Ethical guidelines regarding security and privacy of data should be protected, especially as more and more the data is available through wearables and IOT. The data should be strictly used for clinical purposes only.
- AI systems when used for healthcare would have to be tested against all 7 DEEP-MAX parameters.



- The AI system must be explainable and auditable. All decisions made in the context of diagnosis or recommendations can impact on human lives. As such the underlying algorithms must be transparent and explainable to ensure ease of audit rather than acting as a black-box based system.
- AI systems should not exhibit bias. The algorithms developed for the AI system must not exhibit any racial, gender or Pincode-based decision-making that disenfranchise or favour any population groups.
- AI healthcare systems must conform to human values and ethics. Regulatory bodies must ensure that human ethical values are an integral element of AI algorithms and resulting decision-making.
- Adoption of AI based healthcare must be benefits-driven. The migration toward greater levels of technology use may not be universally accepted or trusted by the medical staff within healthcare institutions. The impact and change in working practices must not be underestimated by policy makers, who need to ensure that changes are geared to the benefits to patients and the overall healthcare of the Indian people.
- Pilot initiatives should be developed within key states to trial the impact that AI systems could have on existing healthcare systems and infrastructure. Lessons should be learned from these initiatives before, wider rollout at a national level.

Redesigning Public Health

The outbreak of corona virus is alerting the world about global public healthcare. This human hazard has drawn the attention all global leaders towards public healthcare system.

Weak Public Healthcare System

- The public healthcare system is not equipped with intensive care unit and ventilators, pathology and clinical laboratories, surgical instruments with sufficient medical and paramedical forces. It resulted in hard healthcare and soft healthcare supply constraints.
- The medical industry, comprising of hard segment like pharmaceuticals, surgical instruments, medical devices, pathological and clinical laboratories for testing virus and soft segment comprising of soft segment like service of doctors, specialists, nurses, medical education and research and other paramedical forces, fails to function and operate with network as software and IT companies during the outbreak of coronavirus.
- This is a total failure on the part of global public healthcare system in consolidating and deploying the health force to combat corona and safeguard the global community.



Re-engineering of Healthcare System

- Now, it is time to think of building a healthcare network with national buffer and global pump house for public health services.
- The proposed national buffer can be operated as a global pump house for healthcare and to save global population.
- This is not high time to think of buffer for healthcare services on lines with buffer stock operation for public distribution.
- The world trade organization in association with its member countries can work out a plan to build national buffer for health service by supporting and standardizing medical education.

China's Public Healthcare Model

- It is interesting to observe that the outbreak of corona in the hard hit province of China subdued using national buffer and pump house of medical and paramedical forces as defense force.
- The trained medical and paramedical forces pooled for public healthcare service using a network is called national buffer and the healthcare service is provided by operating this buffer as pump house during the time of health emergency.
- China has kept ready medical and paramedical forces on public records as buffer and successfully operated as pump house to combat coronavirus.
- China is the first country to adopt the strategy of national buffer and pump house for public healthcare service during the outbreak of corona.

Conclusion

- Ensuring public healthcare security through the national buffer by pooling medical and paramedical force and operating it as global pump for deployment of medical force during health emergencies should be the goal of global health policy.
- The World Trade Organisation in association with WHO and other international organisations view this global public issue seriously in promoting global trade in health services.
- A global strategy for national buffer and global pump house for health service with network could be worked out for the benefit of global community.
- The proposed health buffer could be operated as pump house under the norms of World Trade Organisation to conduct inter-regional and global trade in health services.



- The world can build strong and healthy nations with public healthcare system. It is in this context, the review of public healthcare system and examining the opportunity of trade in health services by adopting the strategy of national buffer and global pump house for health services becomes important.
- The careful examination of population cartogram shows that large countries of the world with small population shrink in size if public healthcare system is not sound enough to protect their population. This is a serious warning to all developed nations to work out some strategy.
- The strategy of national buffer for healthcare and operating it as pump house for global trade in health services increases export earnings of member countries besides acting as an engine of economic growth.
- The strategies should aim at exploiting country's comparative advantage in niche areas of health sector with regional and international cooperation.
- This is the right time to draw the attention of global leaders towards the issue of national buffer and global pump house for health service for sound public healthcare system and global trade in health service and make them alert in designing health policy to achieve millennium developmental goals.