Internship Training

At

International Institute of Health Management Research, New Delhi

IMPACT OF COVID-19 OUTBREAK ON OTHER COMMUNICABLE DISEASES (TB, DENGUE & MALARIA)

By

Name – Shivani Sharma
Enroll No. PG/19/078

Under the guidance of
Dr. Sumant Swain

Post Graduate Diploma in Hospital and Health Management

2019-2021

International Institute of Health Management Research

New Delhi

Internship Training

At

International Institute of Health Management Research, New Delhi

Impact of Covid-19 Outbreak on other communicable diseases (TB, Dengue & Malaria)

By

Name – Shivani Sharma

Enroll No. PG/19/078

Under the guidance of

Dr. Sumant Swain

PGDM (Hospital and Health Management) 2019-21

International Institute of Health Management Research

New Delhi

The certificate is awarded to

Shivani Sharma

In recognition of having successfully completed his/her internship in the department of **Research** and has successfully completed his/her project on

Impact of Covid-19 Outbreak on other communicable diseases (TB, Dengue & Malaria)

10.06.2021

International Institute of Health Management Research, New Delhi

She come across as a committed, sincere &
diligent person who has a strong drive &
zeal for learning.
We wish him/her all the best for future endeavors.

Dean Research
IIHMR, Delhi.

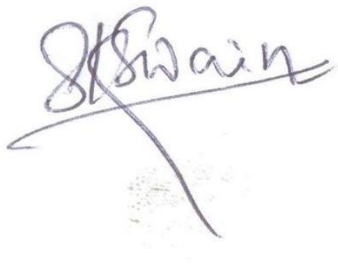
TO WHOMSOEVER IT MAY CONCERN

This is to certify that ***Ms. Shivani Sharma*** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research; New Delhi has undergone internship training at International Institute of Health Management Research, New Delhi from 1st March to 31st May 2021.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific, and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his/her future endeavors.



Ms. Divya Aggarwal
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Sumant Swain
Assistant Professor
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled "**Impact of Covid-19 Outbreak on other communicable diseases (TB, Dengue & Malaria)**" at **"International Institute of Health Management Research, New Delhi"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** (Hospital & Health Management) for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

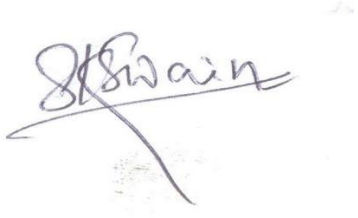
Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
_____	_____
_____	_____
_____	_____

Certificate from Dissertation Advisory Committee

This is to certify that ***Ms. Shivani Sharma,*** a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. She is submitting this dissertation titled "***Impact of Covid-19 Outbreak on other communicable diseases (TB, Dengue & Malaria)***" ***at "International Institute of Health Management Research, New Delhi"*** in partial fulfillment of the requirements for the award of the PGDM (Hospital & Health Management).

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report, or book.



Prof. (Dr). Preetha G S
Professor and Dean Research
IIHMR- Delhi

Dr. Sumant Swain
Assistant Professor
IIHMR-Delhi

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled *Impact of Covid-19 Outbreak on other communicable diseases (TB, Dengue & Malaria)* and submitted by ***Ms. Shivani Sharma*** Enrollment No. PG/19/078 under the supervision of Dr. Preetha G.S and Dr. Sumant Swain for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 1st March to 31st May, 2021 embodies my original work and has not formed the basis for the award of any degree, diploma associateship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

Ms. Shivani Sharma

FEEDBACK FORM

Name of the Student: Ms. Shivani Sharma

Dissertation Organization: International Institute of Health Management Research, New Delhi

Area of Dissertation: Research

Attendance:

Objectives achieved:

Deliverables:

Strengths:

Suggestions for Improvement:

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

Signature of the Officer-in-Charge/ Organization Mentor (Dissertation)

Date:
Place: New Delhi

ACKNOWLEDGEMENTS

As three months of dissertation period come to an end, I would like to thank everyone, without whose contributions, this project would have been impossible to complete, all those who helped me get an enriching experience.

First of all, I also want to thank Prof. (Dr.) Preetha GS, Dean, Research, IIHMR, Delhi for letting me part of this enriching journey as a researcher at IIHMR Delhi. Thank you, Ma'am, for your constant support and belief and taking me in this project as my dissertation.

I am very grateful to my mentor Dr. Sumant Swain, IIHMR Delhi for giving me constant support and guidance during my project.

I would also like to thank all my teachers without their support, my experience and my knowledge would have remained incomplete.

I would also like to extend my Vote of appreciation to my guide in my organization wherein I completed my dissertation, Dr. Jaswinder for her constant guidance, support, and enriching information that she shared all through the tenure. It was with her support and guidance that I learnt research related aspects and helped in my growth and learning.

The completion of my summer training would not have been possible without tireless contribution and consistence of my friends and family.

SHIVANI SHARMA

TABLE OF CONTENTS

International Institute of Health Management Research

New Delhi

BRIEF ORGANIZATIONAL PROFILE

International Institute of Health Management Research (IIHMR) Delhi, a part of the IIHMR Society, was founded on 18th August 2008, with a mandate to focus on national and international health, catering to the growing needs of the country as well as those of the Asia-Pacific region. The Institute aims to play a major role in promoting and conducting research in policy analysis and formulation, strategy development and effective implementation of policies, training, and capacity development in preparing professionals for the healthcare sector. It conducts and designs policy analysis and reviews. It also undertakes intervention research, evaluation studies and operations research studies. The Institute offers a two-year full-time Postgraduate Diploma with specialization in Hospital Management, Health Management and Healthcare Information Technology. The program is approved by the All-India Council for Technical Education (AICTE) and has been accredited by the National Board of Accreditation (NBA). To meet the educational challenges of the rapidly growing health sector in India, IIHMR Delhi equips its students with a strong managerial and technical foundation for careers in consulting, hospital management, health care systems, healthcare quality management, health insurance and healthcare information technology, business analysis and transformation.

The aesthetically designed and magnificently built campus of IIHMR is in Dwarka, New Delhi. The infrastructure as well as the facilities are at par with international standards and meet all academic and administrative requirements. The well-lit spacious air-conditioned classrooms equipped with audio-visual facilities create an atmosphere conducive to learning. The library of the Institute is equipped with the latest books, journals and magazines of national and international standards that are required for academic as well as research activities. The computer center of the Institute is a state-of-the-art facility and uses technologies to provide a competitive advantage to both its faculty as well as the students in core areas of education and research. Three large, air-conditioned conference halls provide adequate space to host national and international conferences, seminars, and workshops within the Institute. Other facilities include individual rooms for the faculty, gymnasium, tennis court, mini-amphitheater, centralized air-

conditioning system and a car-parking lot. The Institute also has a spacious and well-equipped cafeteria and a guesthouse for visiting guests and dignitaries.

Mission

IIHMR is an institution dedicated to the improvement in standards of health through better management of health care and related programme. It seeks to accomplish this through management research, training, consultation, and institutional networking in a national and global perspective.

Vision

IIHMR is a premier institute in health management education, training, research, program management and consulting in the health sector globally. The institute is known as a learning organization with its core values as quality, accountability, trust, transparency, sharing knowledge and information. The institute aims to contribute to social equity and development thorough commitment to support programs aiming at poor and deprived population.

Core Values

The institute is known as a learning organization with the following core values:

- Quality
- Accountability
- Trust
- Transparency
- Sharing knowledge and information

Thrust Areas

IIHMR is engaged in policy issues, program planning and management and capacity building mainly in the health sector. It undertakes research, training, and consulting activities in the following areas:

- Primary Health Care
- Health and Hospital Management
- Health Economics and Finance
- Population and Reproductive Health
- NGO Management and Networking

- HIV / AIDS Program Management and Evaluation

Research Strength at IIHMR

IIHMR has a pulsating research portfolio that primarily focuses on health systems, with a determination to embrace every component of the system into its research and training. The Institute conducts a diverse range of studies that directly or indirectly have a bearing on different levels of the health system, ranging from programme to community to policy level. The Institute conducts evaluation studies, operations research studies and programme evaluations on different dimensions of the health system for a range of different clients including national and state government organizations, national and international non-government organizations, as well as UN agencies, such as, WHO, UNICEF etc. The key areas of research include reproductive and child health, functioning of health care organizations, non-communicable diseases, health economics, and population-based issues and climate change.

Capabilities

- Management Research, Education and Training
- Planning, Designing and Conducting Management Training for Health Professionals
- Institutional Capacity Development and Networking
- Project Planning and Management
- Operations Research and Evaluation
- Economic and Financial Analysis
- Survey Research
- Social Assessment
- Quality Assurance
- Health Sector Reforms
- Programme Evaluation
- Health Information Technology

IMPACT OF COVID-19 OUTBREAK ON OTHER COMMUNICABLE DISEASES (TB, DENGUE & MALARIA)

ABSTRACT

Background-COVID-19 has affected over 200 countries across the world; the world is looking for ways to address this challenge. The COVID-19 pandemic has currently overtaken every other health issue throughout the world. Most of the countries are already struggling with the disease burden of communicable and non-communicable disease. The **Objective** of this study is to analyze the impact of covid19- on the trends and prevention of other communicable diseases. The study **aims** to answer question like: How the covid-19 pandemic impacted the prevalence and incidence of other communicable diseases? In what ways it has impacted the activities of prevention and control program of selected disease? The **Methodology** adopted is a narrative review using keywords for searching internet databases like Pub Med, Google Scholar, Lancet and JGate. The inclusion criteria for the search are English only articles/papers, full text articles. A total of 19 papers were reviewed. The **Results** highlights that how the covid-19 emergence and closures due to it caused the disruption of health services of selected communicable diseases as well. There are significant concerns that the arrival of COVID-19 is currently overlapping with other viruses, and other communicable diseases particularly dengue, malaria & Tuberculosis various endo-epidemic regions across the world.

Most of the communicable diseases have contact, airborne and/or droplet mode of transmission. In some of the countries like Taiwan a study showed that the use of masks and sanitizer, as well as other preventive measures like social distancing for prevention leads to significantly to the decline in the outbreak of other infectious diseases. While in COVID-19 has led to massive health system disruption with the cancellation of routine health services in many settings. During the outbreak, a modeling study estimated 10 632 deaths from TB, malaria and HIV/AIDS in West African countries with 50% reduction in health services Decrease in BCG vaccination coverage for newborns can lead to decreased protection against TB in the early years of life. Implementation of quarantine, social distancing, and community containment measures have reduced access to routine HIV testing, which challenges completion of UNAIDS' first 90-90-90 target globally

Key Words- Covid-*19, Communicable Diseases, Tuberculosis, Dengue, Malaria, Infectious disease*

LIST OF ABBREVIATIONS

TB	Tuberculosis
PLHV	People living with HIV
WHO	World Health Organization
BCG	Bacillus Calmette–Guerin
CDC	Centers for disease control and prevention
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome

INTRODUCTION

Corona virus disease 2019 (COVID-19), caused by severe acute respiratory syndrome corona virus (SARS-CoV-2), has rapidly spread throughout the world. The COVID-19 pandemic has currently overtaken every other health issue throughout the world. Most of the countries are already struggling with the disease burden of communicable and non-communicable disease.

There are significant concerns that the arrival of COVID-19 is currently overlapping with other viruses, and other communicable diseases particularly dengue, malaria &Tuberculosis in various endo-epidemic regions across the world. [2]

Most of the communicable diseases have contact, airborne and/or droplet mode of transmission. In some of the countries like Taiwan a study showed that the use of masks and sanitizer, as well as other preventive measures like social distancing for prevention leads to significantly to the decline in the outbreak of other infectious diseases. [14] While in COVID-19 has led to massive health system disruption with the cancellation of routine health services in many settings. During the outbreak, a modeling study estimated 10 632 deaths from TB, malaria, and Dengue in West African countries with 50% reduction in health services. [7]

Decrease in BCG vaccination coverage for newborns can lead to decreased protection against TB in the early years of life. [6] Implementation of quarantine, social distancing, and community containment measures have reduced access to routine HIV testing, which challenges completion of UNAIDS' first 90-90-90 target globally. Covid-19 outbreak has significant impact on the prevalence of the other communicable diseases and their prevention and control program worldwide. [7]

The COVID-19 pandemic, and actions taken in response to it, will have far-reaching consequences on other diseases, poverty, food security, and economic growth. In low income and middle-income countries, a particular concern is the potential impact on three major health priorities, specifically, HIV, tuberculosis, and malaria, due to a possible disruption to health services. Many low-income and middle-income countries have high burdens of these three diseases, and millions of people depend on large scale programmes to control and treat them. [2] In recent years, substantial progress has been made in reducing

the burden of HIV, tuberculosis, and malaria, and ambitious targets have been set for reaching very low levels of burden by 2030, as part of the Sustainable Development Goals. Interruptions to control programmes could result in major setbacks, compounding the direct impact of COVID-19. [7]

Objectives

- To analyze the trends and prevalence of other infectious and communicable diseases at the same time of covid-19 outbreak.
- To analyze the impact of prevention and control program of other communicable diseases in covid-19 pandemic areas.

Research Question

- How the covid-19 pandemic impacted the prevalence and incidence of other communicable diseases? (TB, Dengue & Malaria)
- In what ways covid-19 hampers the activities of prevention & control program of selected diseases?

Review of Literature

There has been increase in the trends of communicable and non-communicable diseases in developing countries, where the socio-economic and demographic transition imposes more constraints on tackling with double burden of communicable and non-communicable diseases in a poor environment, characterized by poor- health systems. [8]

Worldwide, developed and developing countries are facing the double burden of infectious and non-infectious disease. However, developing countries are more exposed and more vulnerable due to a multitude of factors, including geographic, demographic, and socio-economic factors. Noninfectious diseases like cancer, cardio-vascular diseases diabetes, mental disorders and chronic obstructive pulmonary disease are affecting developing countries with an increasing trend. In corresponding, communicable diseases like such as HIV/AIDS, malaria, tuberculosis, acute respiratory infections and diarrheal disease are causing high mortality rates especially in low- and middle-income countries. [6]

Emergence of Covid-19 - World has been fighting COVID-19 for more than a year now, facing numerous difficulties and losses. Worldwide health system, despite adversities owing to the lack of resources and trained professionals in the poorest regions, has proven to be efficient enough to bring down, over time, the growing trends of this disease. [9] Channeling the available health resources to fight COVID-19 seemed plausible and proved effective indeed. However, with the saturation of health resources and the justified intense heed towards COVID-19.

The COVID-19 pandemic, and actions taken in response to it, will have far-reaching consequences on other diseases, poverty, food security, and economic growth. In low-income and middle-income countries, a particular concern is the potential impact on three major health priorities, specifically, HIV, tuberculosis, and malaria, due to a possible disruption to health services. Many low-income and middle-income countries have high burdens of these three diseases, and millions of people depend on large scale programmes to control and treat them. (Alexandra B Hogan et. al.).

There is a similarity of clinical features of TB and malaria, with those used to track COVID-19 cases. This coupled with institutional mistrust and misinformation might result in many patients with clinical features like those of COVID-19 being hesitant to voluntarily seek care in a formal health facility. [15-16] the current measures to control COVID-19, these populations might face unprecedented difficulties to access essential services, mainly due to reduced ability of patients to support direct and indirect medical costs, and unavailability of transportation means to reach health facilities. The current measures to control COVID-19 include quarantine of suspected cases, isolation of infected patients, contact tracing, and among other strategies. These might not have good acceptability in some communities. Therefore, many patients with clinical features similar to those of severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) infections, which might be COVID-19, and/or any other disease with similar symptomatology, might be hesitant to voluntarily seek testing and treatment in a formal health facility. [3] Additionally, in most cases SARS-CoV-2 infection presents itself with mild symptoms. This coupled with fear of high scrutiny that might be associated with a COVID-19 diagnosis may also lead to individuals not seeking care and therefore facilitate the spread of the pandemic.

Methodology

Literature search

This study was a secondary research. A literature review using key words like Covid-19, Communicable Diseases, Tuberculosis, Dengue, Malaria & Infectious disease was done by searching the internet basis like Google scholar, pro quest advanced search, Pub Med advanced search, Wiley, J Gate.

Inclusion criteria for the search included the period of search i.e., last one year papers (from March 2020 to May 2021) were collected. Mainly those studies are selected which describe about the trends and prevention programs of communicable diseases namely: TB, Dengue, and Malaria in covid-19 pandemic areas.

Various combinations of the keywords were used for each condition to search Google Scholar, and its first 50 pages were screened for relevant and non-duplicate articles. Similarly, various combinations of the keywords were used in each of the databases and the same process repeated. Cross-references of all selected articles were scanned for additional studies.

Exclusion Criteria- Articles of any language other than English, Grey literature like unpublished data, dissertations, and papers that talk about Co infection conditions with covid-19, clinical characteristics of communicable and any non-communicable diseases are excluded

Study Design is Descriptive study based on literature review.

Study Data- Secondary data was used in the study for a narrative review. PRISMA diagram was generated based on the articles retrieved and shortlisted for the study.19 articles were analyzed.

Study Location-

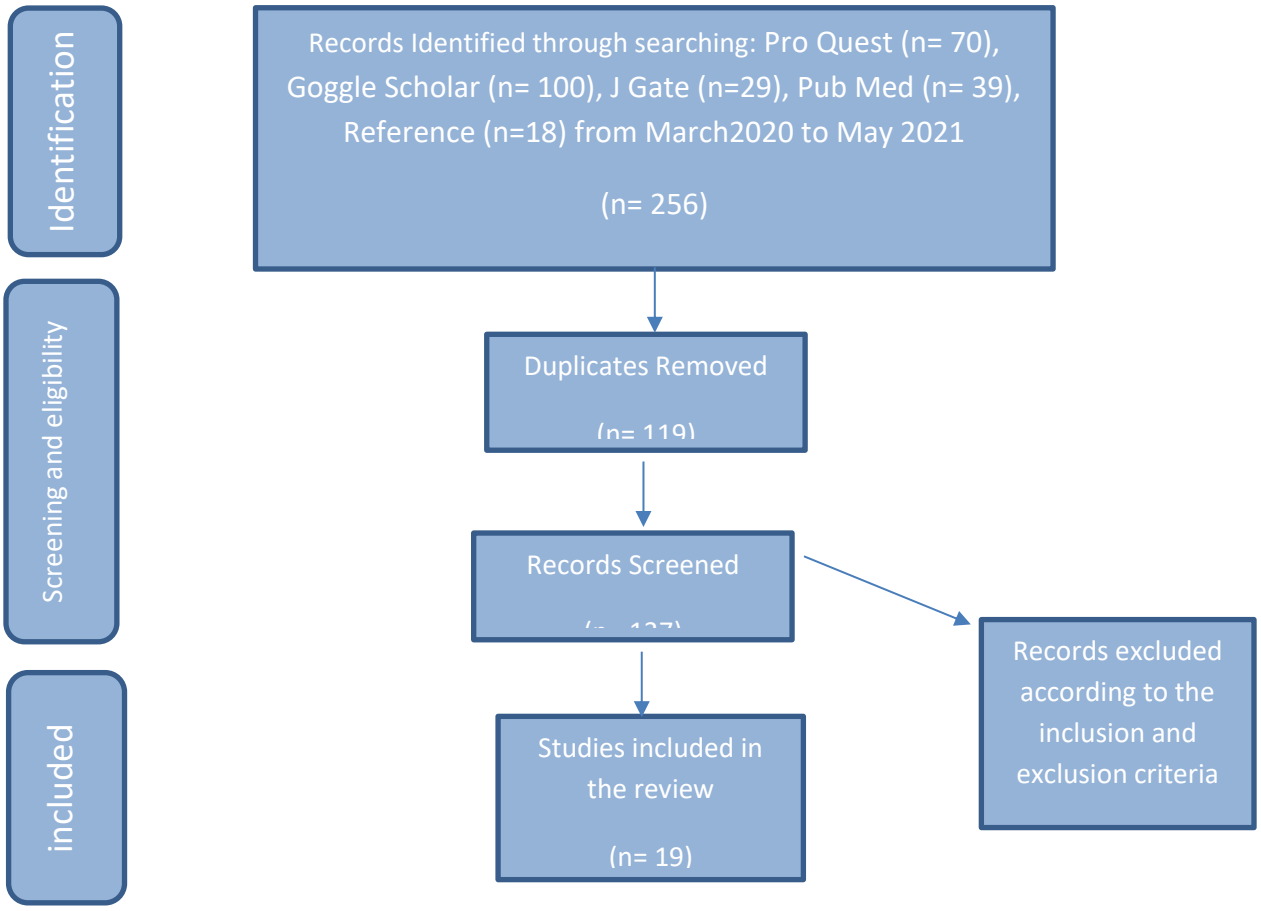
For selected communicable diseases (TB, Malaria & Dengue) we have analyzed the following countries studies:

Disease	Country
Malaria	India, Peruvian Amazon& Sub-Saharan Africa
Dengue	India, Colombia
Tuberculosis	India, Kenya, Pakistan

Table 1

Result

The result of the study highlights the impact of covid-19 on the trends of selected communicable diseases (TB, Malaria & Dengue). The study was conducted by reviewing journal articles and technology websites. The short listing of articles is highlighted below using a PRISMA Diagram.



	2017	2018	2019	2020
Malaria	844558	428828 (-50%)	338494 (-21%)	181831 (-47%)
Dengue	188401	101192 (-47%)	157315 (+55%)	39419 (-74%)
Tuberculosis	1827959	21,558,94 (+17.9%)	24,04,815 (+11%)	18,05,670 (-25%)

Table-2 – Prevalence of disease in India

Malaria-

For malaria Peruvian Amazon& Sub-Saharan African countries study has been analyzed.

The Peruvian Ministry of Health reports a near absence of malaria cases in the Amazon region during the COVID-19 pandemic. As COVID-19 started to spread throughout Peru, the Peruvian government established strict quarantine measures and a nationwide lockdown in March 2020. [13]

Closures have contributed to delays in reporting malaria testing and confirmed cases in the entire region. On the other hand, people at home were also affected in diverse ways; many seemed to be dominated by fear, especially of attending health facilities. All of this has limited the collecting of key data, which hampers the determination of whether COVID-19 may have negative effects on national programs. [13] Malaria control activities, such as vector control, active detection, and community education, were postponed because of COVID-19 which leads to increase in malaria cases, but these cases are not reported. According to MZP preliminary reports, the number of malaria specific interventions and activities to date in 2020 has dropped by at least 60% compared with the same period in 2019. The health post malaria notification rate decreased to 62% during the pandemic lock-down. [12-13]

Dengue-

For dengue Colombia and India's paper has been reviewed.

Regarding dengue in India, the situation becomes evident on comparing the epidemiological reports from the past 5 years. 2020 saw an evident decrease in dengue cases, with Maharashtra showing a marked decline of 84%, when compared to 2019. [17]

Two possible factors could have contributed to this reduction in number of cases. One being the lower transmission of the vector due to lockdown and social distancing, and the other being a significant disparity in the reported data of dengue cases." "This disparity can be attributable to an increased attention to the current pandemic, under-diagnosis due to somewhat similar clinical picture to COVID-19 and the lack of available tests owing to a struggling health care system amidst the pandemic. [17]

With the diagnostic complexity between the two being very challenging for the health care professionals as both diseases exhibit nonspecific symptoms like fever, headache, body pain, abdominal pain, malaise, etc., and, therefore, making a differential diagnosis is an arduous feat." Several studies have shown that both the viruses share similar biochemical and hematological findings, such as leucopenia and thrombocytopenia. [16] In addition, a false-positive IgM for dengue has also been identified in serological tests in patients with confirmed COVID-19. [16]

The situation is quite alarming, because erroneous diagnoses, in addition to causing a delay in the initiation of adequate treatment and irrational pharmacotherapy, can also lead to increased mortality rates, greater complications, and hence an increased burden on the health system.
It is necessary to improve the ability to detect and differentiate cases of dengue and COVID-19, use more accurate diagnostic test kits, reducing the chances of errors inherent to the technique. Well-planned strategies for the clinical management and diagnosis of dengue and COVID-19.

Tuberculosis

For TB, the studies found of following countries- Canada, India, UK & Kenya.

TB laboratories are being used to detect SARS-CoV-2 affecting TB testing. TB drug supply and shipments have been disrupted. Limited access to essential medicines is leads to create the conditions for patients to use substandard drugs and/or doses. This, in addition to reducing patient outcomes by increasing Morbi-mortality due to TB might contribute to the emergence and spread of drug resistant pathogens. Reduced access to effective anti-tuberculosis treatment might increase infectiousness of TB patients. [5]

Due to delayed diagnoses tuberculosis-related deaths can increase up to 20% in the next 5 years. [6] Decrease in BCG coverage for newborns can lead to decreased protection against TB in the early years of life. The impact of COVID-19 on routine immunization in Pakistan has shown a 63.8% decrease in all immunizations and 66.8% decrease in BCG immunizations. [7]

A 3-month COVID-19 lockdown followed by a 10-month recovery period in low- and middle-income countries could lead to an additional 6.3 million cases of TB between 2020 and 2025 and an additional 1.4 million deaths. [7]

Potential Impact of the COVID-19 Pandemic on Tuberculosis Control

COVID-19 could impact TB control in several ways, including increasing transmission of TB in the household, delaying the diagnosis and treatment of TB, and increasing poor treatment outcomes and risks of developing drug-resistant TB. The direct and indirect effects of COVID-19 on national and global economies will have both short-term and long-term consequences for TB programs. Impact of COVID-19 on household transmission of TB: One of the measures undertaken by countries to prevent the spread of COVID-19 is advising or requiring people to stay at home until the situation comes under control. While this measure has several advantages in reducing the communitywide transmission of COVID-19, it may also facilitate household transmission of TB. Prolonged contact at household level is one of the risk factors that increase the transmission of TB. A recent modeling study showed that a 3-month lockdown due to COVID-19 would cause an additional 1.65 million TB cases and 438,000 TB deaths in India over the next 5 years. [6-7] TB has a long incubation period; the impact of increased household transmission of TB is only likely to be observed in future years, when an increase in numbers of TB cases may be observed.

Impact of COVID-19 on TB treatment and diagnostic services

Covid-19 Impacted the TB treatment and diagnostic services in several ways: (1) diversion of resources (including human and financial) away from routine services, to manage the pandemic; (2) health service and political leadership, the media and the public focusing on pandemic management and response with limited oversight and accountability of TB programmes; (3) health care personnel experiencing stress and anxiety, key predictors of errors and poor quality of care; (4) health care personnel being required to quarantine, or becoming ill or dying, and therefore not being available for routine services; and (5) stigma and fear of COVID-19 infection at health care facilities, discouraging people from visiting TB services. All these factors will contribute to delays in the diagnosis and commencement of treatment. As untreated pulmonary TB is the main source of TB infection, late diagnosis and treatment of TB may increase the risk of transmission, especially the household transmission of TB as many people are currently at home. Late diagnosis and inappropriate treatment of TB can also increase the risk of poor treatment outcome. [7]

Discussion

The current measures to control the pandemic, as they are being enforced across the continent, neglect important and complex context-specific realities worldwide. We anticipate an unprecedented reduction in the capacity of patients to use health services. Limited access to essential medicines is known to create the conditions for patients to use substandard drugs and/or doses. This, in addition to reducing patient outcomes by increasing Morbi-mortality due to TB, and malaria, might contribute to the emergence and spread of drug resistant pathogens. Moreover, reduced access to effective anti-tuberculosis treatment might increase infectiousness of TB patients. This has the potential to trigger other larger crises in the region and could worsen health inequalities and result in reversal of global health gains in key indicators. [13] Therefore, COVID-19 responses at country level should be tailored to local social, epidemiological, and economic profiles. These should include measures to protect under-served and vulnerable populations, patients with co morbidities and other risk factors, communities living in malaria endemic settings, pregnant women, people under treatment for tuberculosis, and other relevant segments of society. These populations need protection not only from the pandemic, but also from the consequences of its control measures. [11]

Conclusion

The health and economic crisis created by the current COVID-19 pandemic, as well as the public health measures taken to stop the spread of the virus, could have a potential impact on TB, malaria & dengue prevention, and control in many ways. COVID-19 led to massive health system disruption of routine health services, underreporting of cases has been observed. As because of covid-19 patients were hesitant to visit health care facilities and to seek treatment that leads of lack of reporting in new cases.

This covid-19 contributed to 60% more deaths from TB, malaria, and dengue in West African countries with 50% reduction in health services. In a severe disruption scenario, over the next five years TB deaths could see increases of 4-16%, while TB incidence could see increases of 3-9%.. These insights can be valuable in informing planning for post-lockdown TB measures in any country setting. Increases in TB burden can take months to manifest, but years to undo. Covid-19 preventive measures like social distancing, masks, hand sanitization also lead significantly to the decline in the outbreak of other infectious diseases in some countries.

Recommendations

The proportion of the cumulative disease burden associated with the COVID-19 pandemic due to failures in endemic disease management might end up being greater than that directly caused by COVID-19 itself. It is essential that health systems attempt to maintain routine services for endemic infectious diseases to the highest level possible, recognizing that this may, through necessity, be lower than pre-pandemic levels. It is also essential that health systems have a plan for returning to full-service levels as soon as possible, for controlling major endemic diseases such as TB, dengue and other vector borne diseases. [15] Economic analyses of the impact of the pandemic should include indirect effect like disruption to routine services and subsequent burden of TB and other endemic infectious diseases. Public health vigilance is necessary to mitigate the impact of COVID-19 on TB prevention and control, with plans in place to manage any increases of TB burden in future years. [5]

Limitations

This study has certain limitations like:

1) as covid-19 is a very recent event, very fewer studies are available which were showing the impact of covid-19 with the selected communicable diseases (TB, Malaria, and Dengue).

2) The data recorded in 2020 might not be true, as covid-19 leads to underreporting of new cases of selected disease.

References

1. Galvin, C. J., Li, Y.-C. (Jack), Malwade, S., & Syed-Abdul, S. (2020). COVID-19 preventive measures showing an unintended decline in infectious diseases in Taiwan. *International Journal of Infectious Diseases*, *98*, 18–20. https://doi.org/10.1016/j.ijid.2020.06.062
2. Soo, R. J. J., Chiew, C. J., Ma, S., Pung, R., & Lee, V. (2020). Decreased Influenza Incidence under COVID-19 Control Measures, Singapore. *Emerging Infectious Diseases*, *26*(8), 1933–1935. https://doi.org/10.3201/eid2608.201229
3. Dittrich, S., Lamy, M., Acharya, S., Thu, H. K., Datta, R., Blacksell, S. D., Hein, P. S., Mercado, C. E. G., Ding, X. C., & Chebbi, A. (2020). Diagnosing malaria and other febrile illnesses during the COVID-19 pandemic. *The Lancet Global Health*, *8*(7), e879–e880. https://doi.org/10.1016/S2214-109X(20)30210-2
4. Doungmo Goufo, E. F., Khan, Y., & Chaudhry, Q. A. (2020). HIV and shifting epicenters for COVID-19, an alert for some countries. *Chaos, Solitons & Fractals*, *139*, 110030. https://doi.org/10.1016/j.chaos.2020.110030
5. Alene, K. A., Wangdi, K., & Clements, A. C. A. (2020). Impact of the COVID-19 Pandemic on Tuberculosis Control: An Overview. *Tropical Medicine and Infectious Disease*, *5*(3), 123. https://doi.org/10.3390/tropicalmed5030123
6. Jiang, H., Zhou, Y., & Tang, W. (2020). Maintaining HIV care during the COVID-19 pandemic. *The Lancet HIV*, *7*(5), e308–e309. https://doi.org/10.1016/S2352-3018(20)30105-3
7. Torres, K., Alava, F., Soto-Calle, V., Llanos-Cuentas, A., Rodriguez, H., Llacsahuanga, L., Gamboa, D., & Vinetz, J. (2020). Malaria Situation in the Peruvian Amazon during the COVID-19 Pandemic. *The American Journal of Tropical Medicine and Hygiene*, *103*(5), 1773–1776. https://doi.org/10.4269/ajtmh.20-0889
8. Hogan, A. B., Jewell, B. L., Sherrard-Smith, E., Vesga, J. F., Watson, O. J., Whittaker, C., Hamlet, A., Smith, J. A., Winskill, P., Verity, R., Baguelin, M., Lees, J. A., Whittles, L. K., Ainslie, K. E. C., Bhatt, S., Boonyasiri,

A., Brazeau, N. F., Cattarino, L., Cooper, L. V., … Hallett, T. B. (2020). Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: A modelling study. *The Lancet Global Health*, *8*(9), e1132–e1141. https://doi.org/10.1016/S2214-109X(20)30288-6

9. Cilloni, L., Fu, H., Vesga, J. F., Dowdy, D., Pretorius, C., Ahmedov, S., Nair, S. A., Mosneaga, A., Masini, E., Sahu, S., & Arinaminpathy, N. (2020). The potential impact of the COVID-19 pandemic on the tuberculosis epidemic a modelling analysis. *EClinicalMedicine*, *28*, 100603. https://doi.org/10.1016/j.eclinm.2020.100603
10. Long, R., King, M., Doroshenko, A., & Heffernan, C. (2020). Tuberculosis and COVID-19 in Canada. *EClinicalMedicine*, *27*, 100584. https://doi.org/10.1016/j.eclinm.2020.100584
11. Adepoju, P. (2020). Tuberculosis and HIV responses threatened by COVID-19. *The Lancet HIV*, *7*(5), e319–e320. https://doi.org/10.1016/S2352-3018(20)30109-0
12. Malik, A. A., Safdar, N., Chandir, S., Khan, U., Khowaja, S., Riaz, N., Maniar, R., Jaswal, M., Khan, A. J., & Hussain, H. (2020). Tuberculosis control and care in the era of COVID-19. *Health Policy and Planning*, *35*(8), 1130–1132. https://doi.org/10.1093/heapol/czaa109
13. Amimo, F., Lambert, B., & Magit, A. (2020). What does the COVID-19 pandemic mean for HIV, tuberculosis, and malaria control? *Tropical Medicine and Health*, *48*(1), 32. https://doi.org/10.1186/s41182-020-00219-6
14. Bokhari, S. M. M. A., Mahmood, F., & Bokhari, S. M. S. A. (2020). Case Report: Diagnosis of COVID-19 versus Tropical Diseases in Pakistan. *The American Journal of Tropical Medicine and Hygiene*, *103*(1), 77–78. https://doi.org/10.4269/ajtmh.20-0356
15. Sardar, S., Sharma, R., Alyamani, T. Y. M., & Aboukamar, M. (2020). COVID-19 and Plasmodium vivax malaria co-infection. *IDCases*, *21*, e00879. https://doi.org/10.1016/j.idcr.2020.e00879

16. Amimo, F., Lambert, B., & Magit, A. (2020). What does the COVID-19 pandemic mean for HIV, tuberculosis, and malaria control? *Tropical Medicine and Health*, *48*(1), 32. https://doi.org/10.1186/s41182-020-00219-6

17. Jiang, H., Zhou, Y., & Tang, W. (2020). Maintaining HIV care during the COVID-19 pandemic. *The Lancet HIV*, *7*(5), e308–e309. https://doi.org/10.1016/S2352-3018(20)30105-3

18. Torres, K., Alava, F., Soto-Calle, V., Llanos-Cuentas, A., Rodriguez, H., Llacsahuanga, L., Gamboa, D., & Vinetz, J. (2020). Malaria Situation in the Peruvian Amazon during the COVID-19 Pandemic. *The American Journal of Tropical Medicine and Hygiene*, *103*(5), 1773–1776. https://doi.org/10.4269/ajtmh.20-0889

19. Galvin, C. J., Li, Y.-C. (Jack), Malwade, S., & Syed-Abdul, S. (2020). COVID-19 preventive measures showing an unintended decline in infectious diseases in Taiwan. *International Journal of Infectious Diseases*, *98*, 18–20. https://doi.org/10.1016/j.ijid.2020.06.062