

Standard IX

Action Research Project

Topic for 2020–2021

Infection Prevention and Control (IPC) Strategies

Background:

List of the recent epidemics in India

Year	Epidemic
2002 - 2004	SARS
2006	Dengue and Chikungunya
2009	Gujarat Hepatitis
2014 - 2015	Odisha Jaundice
2009, 2014 - 2015	Swine Flu
2017	Encephalitis
2018	Nipa Virus
2019	Coronavirus Disease – 2019 (COVID-19)

Questions:

Why is the occurrence of epidemics so frequent? Why are so many lives lost at the outbreak of each disease? Is it that the infection prevention and control measures are not known or not followed? Why is the control on many of the epidemics delayed for so long? Is it possible to stop the mutations of a virus? How can we coexist with a prevalent virus?

Introduction:

Along with the other parts of the world, India has witnessed several epidemics and pandemics such as SARS, Swine Flu etc., which led to the loss of many lives. But none of these outbreaks were as widespread and as fatal as COVID-19. As Coronavirus spreads, it is realized that epidemics will become more and more common in this era of world-wide connectivity. In our global society, outbreaks of infectious diseases can move from a remote village to a major city on the other side of the world in under 36 hours. There are diseases like Meningitis, Cholera, Ebola, Dengue fever, etc., which spread so rapidly that the infected person is dead within 24 hours! How can we protect ourselves from such diseases?

To proceed through and resist a disease outbreak, governments follow the guidelines issued by CDC (The Centres for Disease Control and Prevention) and WHO (World Health Organization). However, government healthcare systems can't keep a check at an individual level for preventive measures. Hence, it becomes our own responsibility to follow the basic general IPC measures like maintaining good immunity, social distancing, hand hygiene, wearing masks, sanitization, bringing awareness in the community, etc.

Through this project, we will try to

implement measures to prevent infection, control the infection if it takes place and suggest some innovative strategies to prevent future occurrence.

Purpose of the Project:

In the field of science, we perform experiments to verify or find out scientific facts. Likewise, this study is a verification of the previously known facts or to find out some unknown facts about IPC. It is to monitor and modify IPC measures followed in our locality, to become self-reliant in health maintenance, bring awareness about epidemic management. Personal health can be maintained only if health of the entire community and surrounding is maintained.

Terms Used:

- **Strategy**

Strategy is a plan of action designed to achieve a long-term aim. The five stages of the process are goal-setting, data analysis, strategy formation, strategy implementation and strategy monitoring.

- **Infection**

An infection is the invasion of pathogenic microorganisms, such as bacteria, viruses, parasites, fungi or prions in body. The diseases can be spread directly or indirectly from one person to another. The six links of infection include: the infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, and susceptible host. The way to stop germs from spreading is by interrupting this chain at any stage of the link.

- **Infection prevention and control (IPC)**

This is a scientific and practical solution to prevent harm caused by infection. IPC measures are required to be prepared and ready to respond to an outbreak of a disease, eliminate infection

source, slow down human-to-human transmission; identify, isolate and report suspected or confirmed cases and to practice safety measures.

- **Elements / Contents of IPC**

1. Preparedness and readiness: to slow down / stop transmission, provide care for patients, minimize the impact of the epidemic on health systems / social services / economic activity. Educate and involve community in IPC.
2. Adapt disease surveillance to monitor disease activity.
3. Understand the disease and its aspects like its epidemiology, risk factors, case definitions and symptomology, line listing, epi-curves, etc.
4. Understand the standard precautions, transmission-based precautions and disease specific recommendations.

- **Disease Surveillance**

Disease surveillance is the collection, analysis and interpretation of data originating from a variety of sources to evaluate the effectiveness of the IPC measures.

Why is Surveillance Important?

First-hand information collected from a selected locality is important to understanding the disease and its aspects, throw light on unknown facts, finding problems and their solutions to prepare for future events of infection. It answers questions such as what happened, why it happened and how it will not happen again.

Steps of a Surveillance

- Identify investigation team and resources.
- Figure out essential components of the study.
- Decide the selected area for the selected time span with selected criteria.

- Decide your aim or the research question based on the public concerns and unanswered questions.
- Figure out the constraints.
- Construct case definition or group from whom the data is to be collected.
- Collect proof-based information / data by the epidemiologic investigation, environmental investigation, and the interaction with the public and authorities.
- Perform data analysis preferably with line listing and epi-curves (graphs).
- Develop hypotheses.
- Evaluate hypotheses
- Perform additional studies as necessary.
- Implement control measures and bring awareness.
- Communicate findings with the concerned.
- Maintain surveillance.

Some Examples / Research Topics:

General Prevention

- Suggest a plan for the change in the life and livelihood for different categories of people to coexist with a virus.
- **Change of philosophy for infection prevention:** Travel, trade, recreation, education, shopping, commerce, health maintenance practices, building support system for health emergencies, etc.

Community / Locality Specific

- IPC at a Place/ locality / community / schools / workplace / laboratories / sports / home for the aged / paediatric wards / vet hospitals / shopping complexes / long-term care facility etc.
- Study of isolation wards / shelter in place practices created during the recent pandemic.

Disease Specific

- A phenomenological study of an infectious

disease from a selected locality describing the signs, symptoms, progression, number of fatalities, recoveries, average age, sex ratio, pre-existing morbidities, incubation period, etc.

- Study the hotspots in your locality for various infections.
- Study how R0 works and find out the R0 values for various diseases in your locality.
- Study the pathogenesis / descriptive epidemiology / analytical epidemiology of an infectious disease in your locality.
- Compare the prevalence, morbidity and mortality of different types of infectious diseases from your locality. Examples: exogenous, nosocomial, zoonotic, bacterial, viral, opportunistic diseases, etc.

Investigation

- How the 5-stage plan to tackle an infection outbreak worked in your locality: testing, tracing, treating, teamwork, monitoring.
- In spite of the knowledge of the infection prevention, why is the number of COVID-19 patients steadily increasing / increased? A sample study of your locality.
- Interview of police, health workers, government officials regarding the non-compliance of infection preventive measures and its after effects.
- Impact of traditional medicine system/ Indian culture and health habits such as yoga on IPC.
- Find out the cases of antibiotic misuse, immunization issues, high-risk people, comorbidities, etc. from your locality.

Evaluate

- Evaluate the patient safety and health service quality
- The laws and regulations related to IPC
- Pharmaceutical status
- Health impact assessment
- Health-related Sustainable Development

Goals

- The international health regulations followed
- The strategies in ensuring the success of an infection prevention program at an organization
- The goals of public health department
- Vaccination status
- Impact of climate on the outbreak of infections
- Impact of public health interventions on the outbreak of a disease
- Baseline characteristics of a disease for IPC
- Impact of awareness drives
- Safety measures at home and other places by planning surprise visits etc.

Correlation

- Find out the correlation between prevalence and: Health
- Hygiene
- Nutrition
- Immunity
- Standard of living
- Previous medication
- Vaccination
- Age
- Various environmental, social, cultural, individual, geographical factors
- Literacy
- Habits
- Comorbidities
- Precautions taken
- Previous vaccinations
- Preventive measures as per Allopathy, Ayurveda, Homeopathy, etc.
- Home remedies
- Various types of exercises, etc.

Innovations

Suggest post pandemic society sustainability strategies / safety protocols for individuals to prevent epidemics.

Prevention of infection by way of

nurturing biodiversity. Example: biological control of disease: review, issues, remedies. For e.g. Malaria

Start a Health-line newsletter dedicated to infection prevention and control measures.

Development and use: a self-checker to understand a disease / travel-check to prevent infections / information technology for IPC and surveillance / automate surveillance process, etc.

Innovations in personal protective gear for general public /students in need.

What Students Have to Do:

- Select any topic within limits of the main topic.
- Select your aim aligning to the purpose of the project.
- Refer given examples to select your objective or research question.
- Remember the ultimate goal of enhancing health status of your locality.
- Follow the steps of the surveillance.

Note:

- Following the safety measures is the responsibility of students while conducting the project. Social distancing must be maintained during data collection.
- The project has to be action-based in some form, related to your locality, based on actual fact finding and surveillance, with particular target and research question to find the issue and its remedial measures.
- Innovative, non-conventional and practical remedial measures carry more weightage.

References:

- <https://www.google.com/>
- <https://www.cdc.gov/infectioncontrol/index.html>
- <https://www.who.int/infection-prevention/about/ipc/en/>