

Research Article

Retrospective Data Quality Assessment of Typhoid Fever in Geku Block, Upper Siang District, Arunachal Pradesh, India using IDSP (IHIP) Surveillance

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A B S T R A C T

Background: Typhoid fever has become a serious health problem in India. Arunachal Pradesh reports around 3500 cases annually. A review of the Integrated Disease Surveillance Project (Integrated Health Information Platform, i.e., IDSP (IHIP)) weekly data was carried out to assess the data quality audit of typhoid fever surveillance in Geku block, Upper Siang district, Arunachal Pradesh.

Methodology: Retrospective data collected from OPD, IPD, and laboratory records from three health facilities were compared with the data of three months (August, September, and October 2021 or from the 31st to the 43rd week) maintained in DSU Yingkiang. The following attributes were studied for IDSP typhoid surveillance: timeliness, completeness, and zero reporting.

Results: 39 confirmed cases of typhoid were reported. The median age of the participants was 27.5 years, and no death was reported. Reports by CHC Geku were complete and on time, and zero reporting was also done. PHC Katan had no cases in the study period. However, timely reporting was 38% and zero reporting was done 33% of the time. SC Komkar had no cases and no reports were sent in the three months. Thus, reporting for this facility is lagging on all surveillance attributes of timeliness, completeness, and zero reporting.

Conclusion: The concept of zero reporting was not clear among the health personnel. The district is located in hilly and difficult terrain, which is a challenge for internet connectivity at grassroots levels. This leads to late reporting and sometimes to non-reporting.

Keywords: Typhoid Fever, IDSP, IHIP, Surveillance, Arunachal Pradesh

Background

Typhoid and paratyphoid fever are caused by *Salmonella enterica* serotypes Typhi and Paratyphi A, Paratyphi B, and Paratyphi C. They are potentially severe and in a few cases, may lead to fatality.¹ Approximately 17.8 million new cases of typhoid fever are reported each year in various low- and middle-income countries.² India accounts for more than half of the global burden of typhoid fever. Annually around 8 million cases are reported in India, with the average number of deaths being around 70,000.³ Arunachal Pradesh reports around 3,500 cases annually, out of which approximately 80 are reported from the Upper Siang district.⁴ Typhoid surveillance in India is done under the Integrated Disease Surveillance Programme (IDSP) which now records data at the Integrated Health Information Platform (IHIP). A 3x3 Field Epidemiology Training Programme was conducted by the National Centre for Disease Control (NCDC), New Delhi to build capacity among the district-level health professionals of various states for strengthening public health surveillance.⁵

The trainees were the District Surveillance Officer (DSO) and District Epidemiologists and the mentors were faculty from the Department of Community Medicine, Tomo Riba Institute & Health Sciences, and public health specialists from the State Health Department. After completion of the first contact session based on surveillance data quality audit and analysis, trainees had to complete a field assignment on the same. They had to study the three-month surveillance data of a disease, which is a concern of public health in their respective districts.

Objectives

1. To describe the typhoid fever surveillance in Geku block, Upper Siang district from August-October, 2021
2. To assess the data quality timeliness, completeness, and zero reporting
3. To provide recommendations to improve surveillance

Methods

Study Design: Retrospective data analysis

Study Setting

The study was conducted in Geku block, Upper Siang district which shares an international border with China in the north. The district has been declared rural with a population of 35,320, a population density of 5 persons/sq-km, and a literacy rate of 59.99%.⁶

The healthcare delivery system consists of one District Hospital, four Community Health Centres, two Primary Health Centres, 10 wellness centres, and two private laboratories.

Case Definition

Presumptive Case: An acute illness characterised by persistent high fever with any of the following clinical features: nausea, headache, loss of appetite, toxic look, splenomegaly, diarrhoea, constipation, or significant titer in the Widal test.⁷

IDSP definition of enteric fever or typhoid fever: The acute illness characterised by persistent high fever with any of the following clinical features:

- Headache, nausea, loss of appetite, toxic look
- Constipation or sometimes diarrhoea
- Splenomegaly
- Significant titre in Widal test⁸

Case Inclusion Criteria: Clinical diagnosis by a medical officer and positive laboratory identification

Proposed Surveillance Definition⁹

Timeliness: Proportion of all expected reports in a reporting system received by a given due date (on or before Wednesday of each week)

Completeness: Reports that reached the next level from all reporting sites with all required fields filled out as intended

Zero Reporting: The reporting of “zero cases” when no cases have been detected by the reporting unit. This allows the next level of reporting system to be sure that the participants have not sent data that has been lost, or that the participant has not forgotten to report.

Retrospective data for typhoid cases were collected from OPD, IPD, and laboratory records from all the health facilities of Geku block for 3 months (August to October 2021 or from the 31st to the 43rd week). A line list of the laboratory-confirmed cases (Widal) was prepared and compared with the retrospective data.

Ethical Issues

This exercise was conducted as a part of 3*3 field epidemiological training provided by NCDC in collaboration with CDC using the IDSP (now IHIP) recorded database information. Moreover, we have analysed the retrospective data only, therefore no patient safety or identity issues arose from this.

Results

39 cases of typhoid were confirmed. The median age of confirmed cases was 27.5 years. The prevalence of typhoid fever was higher among males (56%). The maximum affected age group was 11-20 years (28.2%) (Figure 1) and cases peaked from the 39th to the 42nd week in 2020 (Figure 2). No mortality was reported.

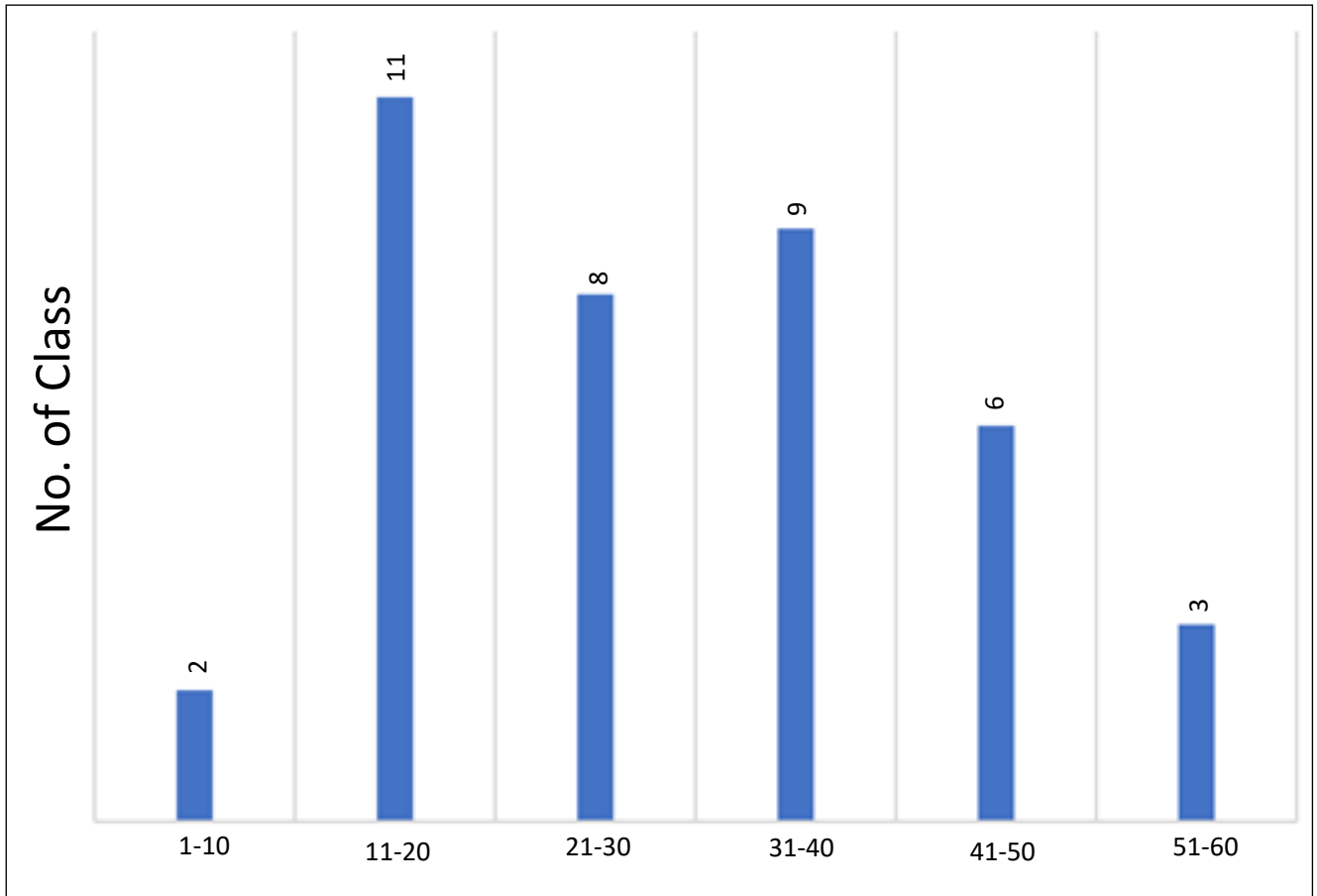


Figure 1. Age Distribution of Confirmed Cases

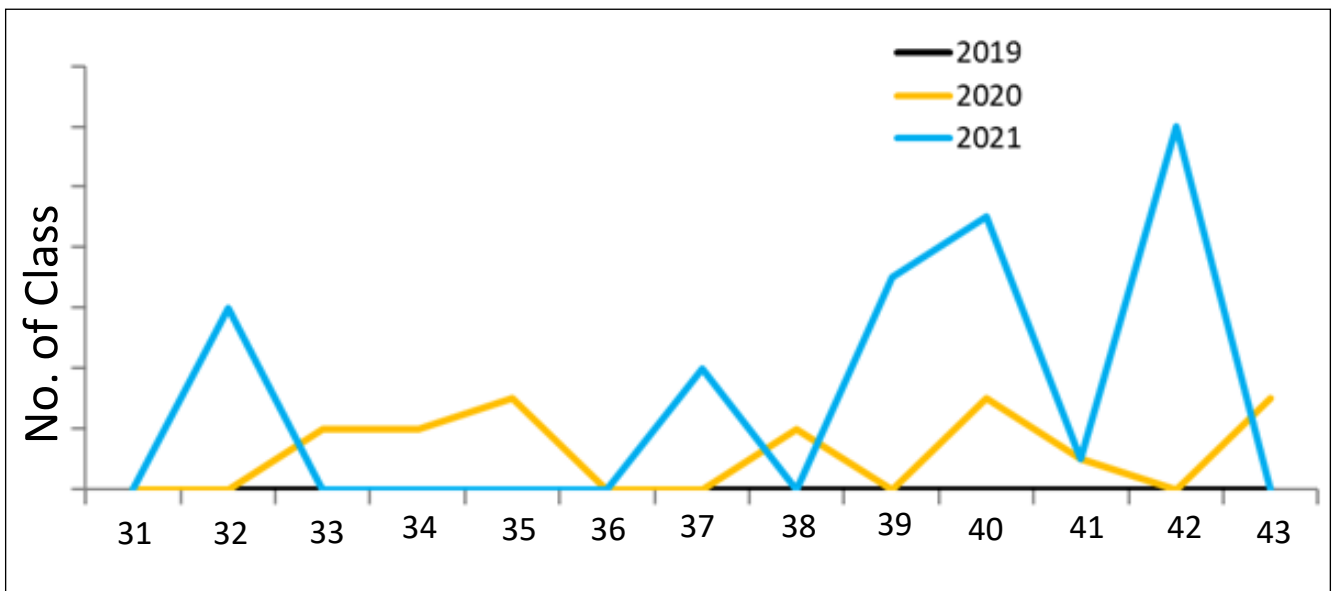


Figure 2. Year-wise Comparison of Typhoid Fever Cases

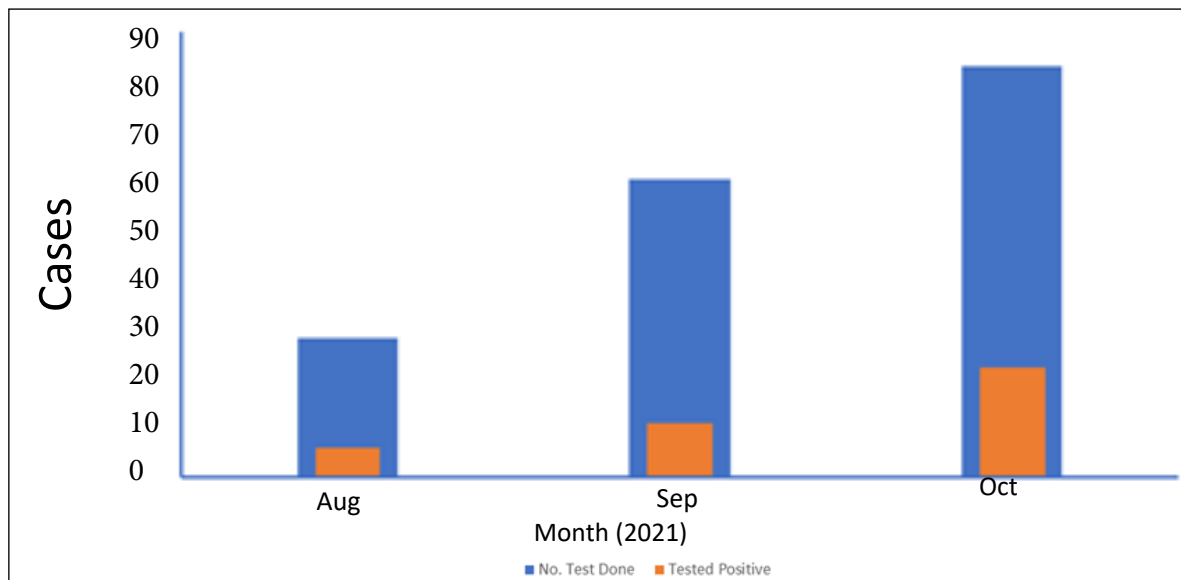


Figure 3. Trend of Widal Test Positivity in the Study Period Compared to Performed Laboratory Tests

Numbers of Test Done

The average Widal test positivity rate was 27% from August to October 2021 with a rise in the absolute number of cases and the number of patients tested in the month of October (Figure 3).

During the 31st-43rd week (2021), only 39 cases of typhoid fever were reported in L-form by CHC Geku to DSU Yingkiong (IDSP).

Table 1. Performance Attributes of Surveillance across the Visited Health Facilities

Attributes	Health Facilities		
	CHC Geku (%)	PHC Katan (%)	SC Komkar
Timeliness	100	38.5	No reporting at all
Completeness	100	33.5	No reporting at all
Zero reporting	100	33.5	No reporting at all

Reports by CHC Geku were complete in terms of timeliness, completeness, and zero reporting (Table 1). PHC Katan had no cases in the study period, zero reporting was done 33% of the time, and timely reporting by the facility was seen 38% of the time. SC Komkar had no cases and no reports were sent. Thus, reporting for this facility is lagging on all surveillance attributes of timeliness, completeness, and zero reporting.

During the personal interview, it was found that all medical officers (MOs), auxiliary nurses and midwives (ANMs), and laboratory technicians knew the IDSP case definition

of typhoid. The concept of zero reporting and that nil reporting is not a proxy for zero cases was emphasised during the field visits.

Discussion and Conclusion

Typhoid fever continues as a major public health problem with an estimated 9 million sick people in 2019 and 110,000 deaths every year.¹⁰ We found 39 cases over our 3 months study period with male predominance. The presenting symptoms were often pathognomonic, prolonged fever, fatigue, headache, nausea, abdominal pain, and constipation or diarrhoea. We did not encounter complications like rash, or even death. Typhoid fever can be treated with antibiotics although increasing resistance to different types of antibiotics is making treatment more complicated.

National Center for Disease Control (NCDC) has identified 32 priority health conditions for surveillance under IHIP, previously IDSP, among which typhoid fever is one. In this exercise, we have assessed the real-time data reporting (along with mobile application) at village and block levels for effective implementation of the programme.

All the levels of health facilities in Geku were analysed in terms of timeliness, completeness, and zero reporting (Table 1). We found scope for improvement of reporting in most of the health facilities. Many times there was a problem with multitasking among the healthcare workers which led to negligence in uploading the data in a timely and complete manner. Zero reporting was often a problem due to misunderstanding. Providing hands-on job training that emphasises on importance of data uploading in a complete, accurate, and timely manner is required.

Typhoid cases increased in the month of October. Among

the healthcare personnel, the concept of zero reporting was not clear. Nil reporting isn't a proxy for zero reporting – this was explained to the health workers being interviewed for this study. The location of the district in hilly and difficult terrain is a challenge for internet connectivity at grassroots levels that is leading to late reporting and sometimes to non-reporting. Telephonic reporting to DSU might resolve the connectivity issue temporarily. Regular feedback to and from the reporting units and periodic training to all staff with special emphasis on zero reporting will improve the surveillance.

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