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AN EVALUATION OF THE PROGRESS OF THE INTEGRATED DISEASE SURVEILLANCE PROGRAMME THROUGH INTEGRATED HEALTH INFORMATION PLATFORM IN TAMIL NADU FROM 2021 TO 2023.

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Abstract

INTRODUCTION : The surveillance system is the armour of public health and preventive medicine. In India surveillance is monitored in real-time through the Integrated Health Information Platforms Integrated Disease Surveillance Programme(IHIP-IDSP). Effective implementation and surveillance depend on the efficiency of the healthcare providers at all levels from peripheral reporting units to the State surveillance units(SSU). The aim of the study was to evaluate the performance of the Surveillance units of Tamil Nadu in IHIP-IDSP.

METHODOLOGY : This cross-sectional study was carried out using the data extracted from the IHIP-IDSP platform from 2021 to 2023 after obtaining official permission from the Director of Public Health and Preventive Medicine, Tamil Nadu. Data was analyzed using SPSS version 21. Results are expressed as frequency and proportion for categorical variables and mean and standard deviation for continuous variables.

RESULTS : There has been a rapid improvement in reporting in the IHIP-IDSP with the number of units reporting, consistency, and quality of the reporting units. The number of units reporting increased from less than 10% at initiation to more than 90% in 2023. Improvement in flagging of events and urban mapping is to be improved. There has been a rapid improvement in the consistency of reporting, and the quality of reporting is improving at a steady phase.

CONCLUSION : The overall performance of the state has been improved but it lacks quality in certain fields. It has to be improved with proper sensitization measured with training and retraining sessions with pre and post-training assessment and mock drills to improve hands-on skills.

KEYWORDS : Integrated Health Information Platform, Integrated Disease Surveillance Programme, Surveillance, Outbreak

INTRODUCTION

India is a developing country with a triple burden of diseases which includes communicable diseases, non-communicable diseases, and nutritional disorders. Several initiatives have been established to fight this triple burden.[1] Non-communicable disease and nutritional disorders are chronic conditions which has a long window period, whereas communicable diseases are major public health problem that has the potential to cause disharmony in the public. They have the potential to spread from one individual to another leading to epidemics or outbreaks of diseases. The recent pandemic of COVID-19 is an example that could have been controlled if the initial cases were identified timely, isolated, and adequate surveillance was initiated.[2,3]

To strengthen the communicable disease surveillance in India, the Ministry of Health, and Family Welfare (MoHFW) launched the Integrated Disease Surveillance Programme (IDSP) in November 2004 with the assistance from World Bank till 2012.[4] The key elements of IDSP are the major five activities which are i) collection of data, ii) compilation of data, iii) analysis and interpretation of data, iv) follow-up action, and v) feedback. Reporting in IDSP was earlier weekly reporting of data collected in the field, institutions,

and laboratories using the 'S' syndromic; 'P' probable; & 'L' laboratory formats using standard case definitions. The data was collected as aggregate numbers rather than as line list. Further, the weekly data was analyzed by the State Surveillance Unit (SSU) or District Surveillance Unit (DSU) to assess the disease trends. In case of a rising trend of illness, it was investigated by the Rapid Response Team (RRT) to perform an outbreak investigation and control the outbreak if any existed. It was later merged with the National Health Mission as a program.[5,6]

In April 2021 IDSP was brought under the next generation highly refined version which is an overarching platform Integrated Health Information Platform (IHIP) as IHIP-IDSP with several updates. It is in sync with the National Digital Health Mission (NDHM).[7] It is a decentralized state-based surveillance system that focuses on major epidemic-prone

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diseases. The IHIP-IDSP helps to identify the early warning signals of impending outbreaks of the reported diseases so that timely and effective responses can be initiated to combat the challenges regarding health in the country at the block level, district level, state level and national level effectively and timely manner.[8,9] However in spite of IHIP-IDSP being functional for almost three years, there has been only few studies on the performance in reporting S/ P/ L form but the performance as a whole is still lacking.

Tamil Nadu ranks second in the health index based on NITI AAYOG report. Tamil Nadu being one of the developed states in India has performed well in terms of healthcare. It has been on the list of top few states to achieve all the goals set by the MoHFW towards the well-being of the community. But only a countable number of studies has been conducted on the performance of individual form or the entire performances in IDSP before the initiation of IHIP-IDSP and hardly any after 2021 for the total performance. Hence this study has been conducted to evaluate the performance of Tamil Nadu in IHIP-IDSP and to focus on the fields where action has to be taken to improve the performance.

METHODOLOGY

STUDY AREA: Tamil Nadu is the tenth largest state in India and covers a population of 7.21 crores according to census 2011 and estimated to be around 8.21 crores as of 2023.[10] It is organized administratively into 38 districts with 12 major corporations. All the districts have designated District Surveillance Units (DSU) headed by the District Surveillance Officer (DSO) and they are monitored by a State Surveillance Unit (SSU) headed by the State Surveillance Officer (SSO). All the 38 DSUs were included in the study at the state level.[11]

STUDY DESIGN AND DATA COLLECTION: This retrospective cross-sectional study was carried out in the state of Tamil Nadu using the data extracted from the IHIP-IDSP platform from its initiation in April 2021 till October 2023. The data contained the performance of all the DSU in the field of performance of daily reporting of S form, P form, L form, and the outbreak in terms of health events response and outbreak investigation and response. The collected data was entered in Microsoft Excel and analysed using IBM-SPSS Version 21. The results were expressed in frequencies, and proportions for categorical variables and interpreted accordingly with appropriate charts and figures. Continuous variables were expressed as mean and standard deviation and expressed as tabulations. Prior permission to carry out the study was obtained from The Directorate of Public Health and Preventive Medicine (DPH & PM) and the SSU.

PERFORMANCE ASSESSMENT: The performance of each District/ State can be monitored in the performance dashboard of the IHIP-IDSP platform. Figure 1 shows how performance is calculated based on (i) Reporting performance, (ii) Urban area mapping (wards to subcenters), and (iii) Outbreak response. They are further classified as S-form reporting, P-form reporting, L-form reporting, Cases reporting, Urban mapping and Outbreak response. The scoring is done on a daily basis and for a selected period the mean score of that period is shown. Each report is given a weightage for performance and a ranking is issued based on the reporting.[11,12]
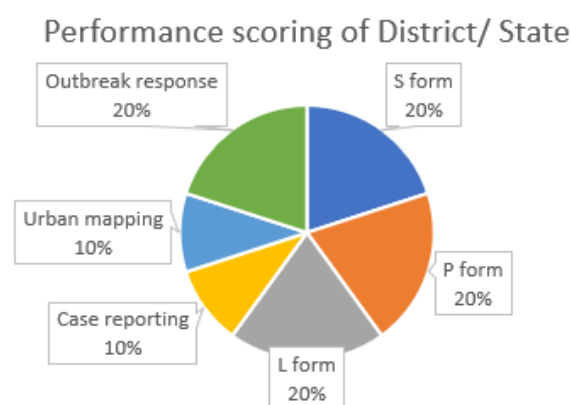

Figure 1: Variables used to assess the performance scoring in IHIP-IDSP.

Performance scoring and weightage for S/ P/ L form is showed in Figure 2. For S/ P/ L forms daily reporting of each unit is given a score based on a specific weightage and the DSU scoring is calculated from the average of all the reporting units (RU) under them. The above scoring of all the DSUs is considered for the scoring and ranking of the SSU/ State which is the average of all the DSUs. When no cases are detected in the field or institution, or the laboratory nil case reporting is mandatory for receiving a score of 20 points. If the case entry or nil case entry is not done on a particular day the scoring for that RU will be lost which will reflect in the performance of the DSUs and SSUs.[11,12]

Case reporting is assessed by the reporting of cases in the IHIP-IDSP platform. It is scored based on the performance of the RUs. It reflects the quality of reporting of the RUs and the effective monitoring of the RUs by the DSUs and SSUs. Even the entry of a single case detected in the field in the S-form or a case identified in the institution for the P-form or a Laboratory confirmed case in the L-form will provide a full score for the reporting of cases.[11,12]

Urban mapping is scored based in the percentage of urban wards mapped with the sub-center. Maximum scoring is provided to all the DSUs when they have completely mapped all the reporting units. It involves mapping the sub-center

with the corresponding village of the panchayat in the block with the corresponding district in the particular state. When the mapping is completed the DSUs will be provided points which has an impact of the SSU.[11,12]
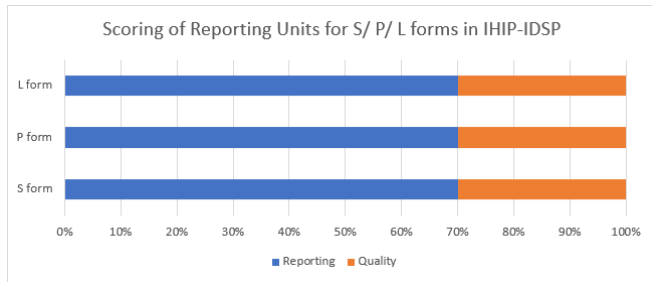

Figure 2: Scoring for reporting units based on reporting S/ P/ L forms in IHIP-IDSP.

Outbreak response of the performance has two components which are shown in Figure 3 with further classifications in scoring. They are the event alert response time and the outbreak completion time. Scoring is given when the response was within the time frame provided with the required details of the event of outbreak.

An event can be flagged by anyone with a reporting login credentials. It can be a healthcare worker (HCW) from the government, a private practitioner, any RU, DSU, SSU, CSU or Media team. Performance scoring for the event alert is analysed based on the investigation by the DSU's investigation team/ Rapid Response Team (RRU) and either converting the event into an outbreak or by closing the event with proper reporting that there is no outbreak potential. The entire event investigation has a window period of 48 hours to be completed to receive the maximum scoring.[11,12]

An outbreak is initiated when an event with outbreak potential is approved by the DSO to be converted as an outbreak. The outbreak is considered completed when no cases have been reported for two incubation periods of the particular disease since the last identified case. Activities scoring in outbreak completion involves deployment of RRT, composition of the RRT, updating details of the outbreak by the RRT members, line listing of cases identified during the investigation, investigations sent to labs, updating results of investigations, feedback and updates by the DSO and sending the outbreak investigation completion with appropriate documents.

Scoring for outbreak performance involves certain criteria. They include,

(i) Events responded- Percentage of events responded out of the events reported during the selected period of time.

(ii) Response time- Percentage of reported events which closed/converted within 2 days of reporting, out of event reported during the selected period.

(iii) RRT deployment- Percentage of new outbreaks where the date of RRT deployment is within 2 days from the outbreak creation date, out of outbreak created during the selected period.

(iv) RRT composition- Percentage of new outbreaks where at least one RRT member is District / State RRT, out of outbreaks created during the selected period.

(v) RRT updates- Percentage of Outbreaks where at least one RRT update was submitted, out of outbreak created during the selected period.

(vi) Line listing of cases- Percentage of Outbreaks where at least one case/death reported line listed, out of outbreak created during the selected period.

(vii) Sample collection- Percentage of Outbreaks with at least one human sample collected, out of outbreak created during the selected period.

(viii) Updating of results- Percentage of Outbreaks with at least one human sample result updated, out of the outbreaks created during the selected period.

(ix) DSO updates- Percentage of Outbreaks where at least one D$O update is available, out of the outbreak created during the selected period and

(x) Outbreak completion- Percentage of outbreaks completed, out of the outbreak created during selected period.[11,12]
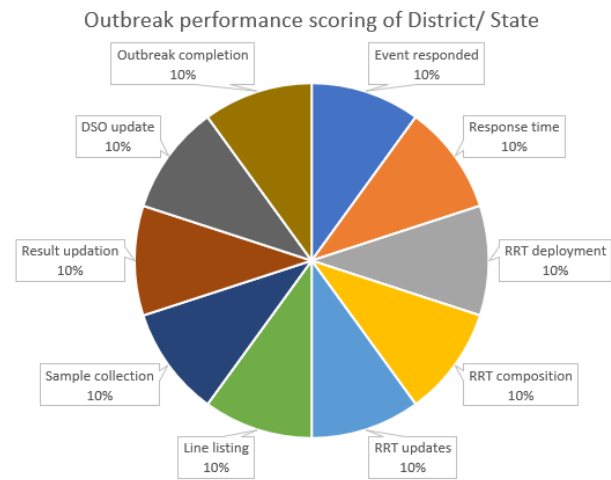
Figure 3: Scoring system for Outbreak performance in IHIP-IDSP.

RESULTS

The performance in IHIP-IDSP is obtained from the IHIP. The mean performance score of States in India from January to October 2023 in IHIP-IDSP is shown in Figure 4. The mean performance score of India in IHIP-IDSP is 70.24. Tamil Nadu has a performance score of 80.25 for the above period which is higher than the National mean and ranks 9th overall behind States like Odisha, Telangana, Bihar, Gujarat,

Karnataka, Tripura, and Union Territories like Daman & Diu, and Puducherry. Overall best performance is observed in Daman & Diu with 93.44 in Union Territories and Odisha with 91.99 in the States.

The total RUs for S-form, P-form and L-form as of October 2023 in Tamil Nadu is 10868, 5732 and 48056 units. The performance of these units has been increasing over the years since the inception of IHIP-IDSP. S-form reporting in IHIP-IDSP was initiated in April 2021 with 431 units reporting initially which improved to 1813 in January 2022 and 8734 units in January 2023. During the year 2023 there was a gradual increase in reporting to 10001 units in September 2023 which fell a few RUs in October 2023 to 9936 units. Similarly, P-form has 5732 RUs which was initiated in 2021 with 392 units reporting at the initiation. The performance improved rapidly to 3625 and 4907 in January 2022 and 2023. The maximum reporting of P form was in the month of September 2023 which has a slight fall in reporting by October to 5514 units. Similar to S-form and P-form, L form RUs as of October 2023 in Tamil Nadu is 4805 units among which 399 units started reporting 2021 when initiated. This reporting improved in significant number to 2912 and 3986 in 2022 and 2023. The maximum reporting of L form was observer during the month of September 2023 with 4628 units reporting and by the end of October 4562

units were reporting in L form. The progress over the years of reporting in the IHIP-IDSP platform is shown in Figure 4.

Table 1 shows the performance of Tamil Nadu in the IHIP-IDSP platform from its initiation in 2021 with a mean score of 37.74 ± 3.95 to October 2023 with a mean score of 78.77 ± 9.34. The performance over the years has been increased during the past three years in all the fields such as S-form 1.83 ± 2.41 to 16.89 ± 3.31 , P-form 7.21 ± 1.87 to 17.48 ± 1.46 , L-form 8.27 ± 2.17 to 17.84 ± 1.52, case reporting 2.25 ± 0.92 to 6.08 ± 2.14 and outbreak response 8.77 ± 3.96 to 12.07 ± 3.91. The urban mapping 8.40 ± 2.52 has been stagnant for all these years.

Table 2 shows the 2023 performance of all the districts in Tamil Nadu in completion of S-form, P-form and L-form. The scoring of these forms' performance is based on the consistency and quality which has been expressed as mean and standard deviation. S form performance ranged from 0.00 in Chennai to 99.99(± 0.24) in Dharmapuri, P form performance ranged from 55.23(± 29.23) in chennai to 91.63(± 12.11) in Dharmapuri and L form performance ranged from 46.62(± 28.23) in Chennai to 92.5(± 11.01) in Cu

Table 3 shows the improvement in the performance of the state of Tamil Nadu in reporting S-forms, P-forms and L-forms over the period of years. The performance improved
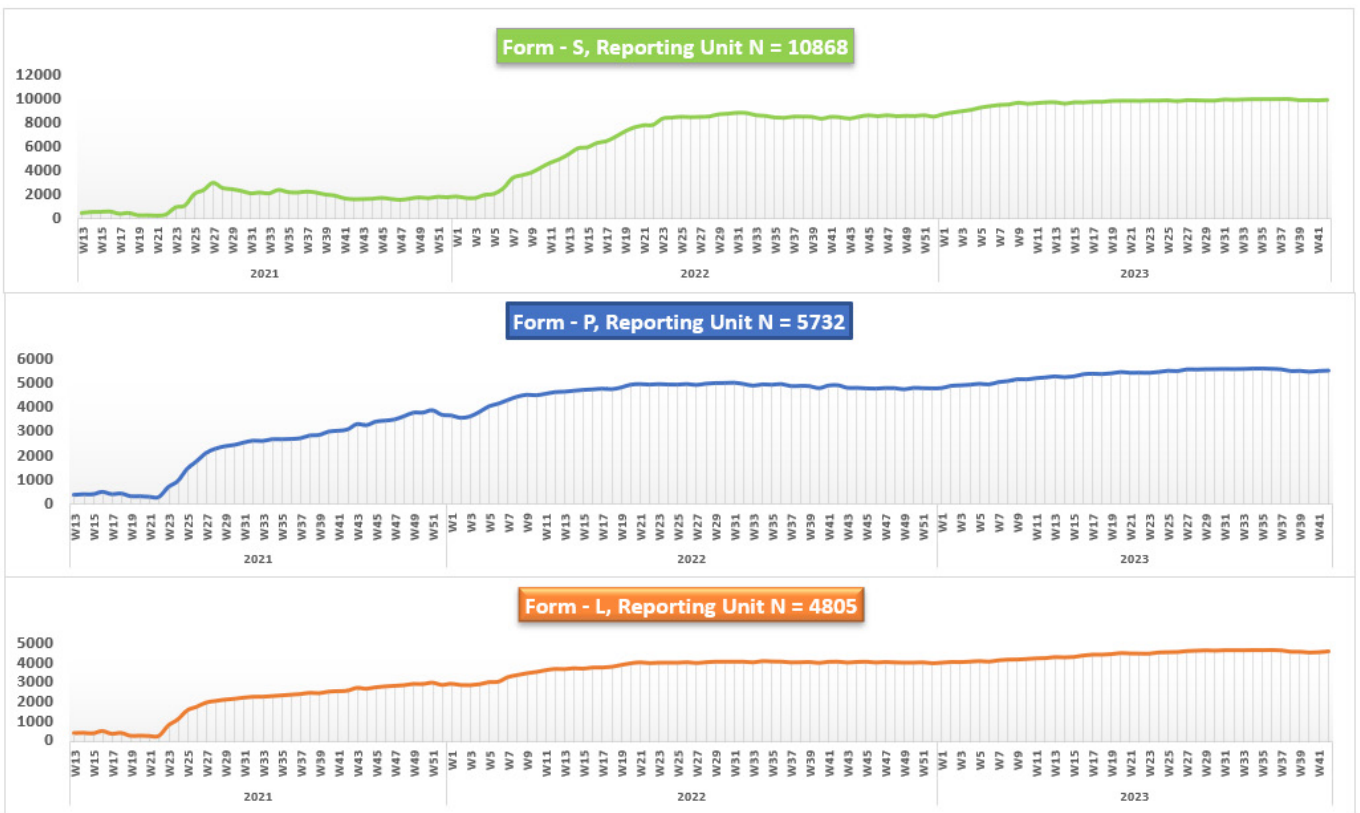

Figure: 4, Line diagram showing the daily reporting trend of S-form, P-form and L-form in Tamil Nadu from April 2021 to October 2023.

Table 1: IHIP-IDSP performance.

Factors	2021 to October 2023 Mean (SD)	2021 Mean (SD)	2022 Mean (SD)	October 2023 Mean (SD)
Total Score (100)	62.5258 (9.09)	36.7368 (8.95)	67.2889 (12.36)	78.7739 (9.34)
S-Form Score (20)	10.305 (2.81)	1.8347 (2.41)	11.2153 (15.40)	16.8982 (3.31)
P-Form Score (20)	13.6768 (1.76)	7.2082 (1.87)	15.3953 (2.61)	17.4797 (1.46)
L-Form Score (20)	14.3192 (1.90)	8.2742 (2.17)	15.9537 (2.56)	17.8392 (1.52)
Case Reporting (10)	4.5695 (1.57)	2.2463 (0.92)	5.0692 (1.91)	6.0803 (2.14)
Urban Mapping (10)	8.4047 (2.52)	8.4047 (2.52)	8.4047 (2.52)	8.4047 (2.52)
Outbreak Response (20)	11.2505 (2.96)	8.7687 (3.96)	11.2508 (3.75)	12.0718 (3.91)

Table 2: Tamil Nadu District wise performance in S-form, P-form, and L-form.

District name	S-form District-wise performance 2023 Mean (SD)			P-form District-wise performance 2023 Mean (SD)			L-form District-wise performance 2023 Mean (SD)		
	Consistency Score	Quality Score	Total Score	Consistency Score	Quality Score	Total Score	Consistency Score	Quality Score	Total Score
Ariyalur	68.5 (1.30)	24.9 (10.03)	93.4 (10.35)	67.35 (8.65)	22.6 (9.85)	89.95 (15.84)	67.37 (9.33)	20.44 (11.93)	87.81 (17.66)
Chengalpattu	55.15 (12.78)	9.49 (10.05)	64.64 (20.25)	50.03 (18.91)	16.31 (12.40)	66.34 (30.55)	47.4 (21.12)	14.42 (13.34)	61.82 (33.52)
Chennai	0	0	0	45.55 (21.20)	9.69 (10.30)	55.23 (29.23)	39.7 (22.1)	6.91 (9.34)	46.62 (28.23)
Coimbatore	54.34 (11.02)	2.58 (3.94)	56.92 (11.06)	59.27 (8.87)	10.38 (10.44)	69.65 (17.17)	55.54 (12.84)	4.96 (8.51)	60.5 (17.39)
Cuddalore	61.48 (6.06)	2.51 (5.51)	63.99 (6.69)	65.36 (5.18)	23.9 (7.34)	89.26 (11.26)	67.89 (3.49)	24.61 (8.54)	92.5 (11.01)
Dharmapuri	69.93 (0.17)	29.97 (0.07)	99.9 (0.24)	69.98 (0.11)	21.66 (12.09)	91.63 (12.11)	69.99 (0.05)	20.16 (13.19)	90.15 (13.19)
Dindigul	62.01 (8.41)	3.87 (8.48)	65.88 (12.25)	59.34 (12.24)	18.31 (11.08)	77.65 (20.80)	59.22 (13.25)	17.23 (12.08)	76.46 (22.54)
Erode	61.33 (9.31)	25.49 (5.89)	86.81 (14.03)	63.45 (5.71)	13.8 (11.71)	77.25 (16.15)	64.83 (5.93)	14.84 (11.98)	79.68 (16.32)
Kallakurichi	69.42 (0.79)	25.78 (5.02)	95.21 (5.15)	66.6 (4.56)	23.98 (9.17)	90.58 (12.07)	67.81 (3.61)	22.31 (11.36)	90.12 (13.89)
Kanchipuram	61.38 (7.16)	8.98 (9.14)	70.37 (11.27)	55.06 (12.96)	18.07 (9.18)	73.13 (21.44)	57.64 (15.24)	18.1 (10.78)	75.73 (24.81)
Kanniyakumari	67.15 (3.06)	25.23 (8.57)	92.38 (9.11)	60.46 (9.19)	13.19 (10.98)	73.65 (17.70)	63.68 (8.87)	16.72 (11.11)	80.4 (17.95)
Karur	64.03 (4.56)	25.65 (4.93)	89.68 (7.90)	62.54 (9.63)	19.93 (11.06)	82.47 (18.21)	67.01 (3.28)	23.17 (10.71)	90.19 (12.85)
Krishnagiri	62.51 (7.69)	26.5 (3.5)	89.01 (11.06)	57.14 (15.93)	22.06 (9.05)	79.2 (23.84)	57.31 (17.63)	20.07 (11.35)	77.39 (27.29)
Madurai	62.32 (8.74)	1.17(4.62)	63.49 (9.82)	62.53 (8.70)	16.36 (12.49)	78.89 (18.79)	62.58 (10.13)	13.61 (12.07)	76.19 (19.90)
Mayiladuthurai	65.84 (8.09)	28.12 (3.56)	93.96 (11.59)	62.4 (15.49)	24.97 (8.37)	87.38 (23.09)	63.36 (16.53)	25.92 (9.26)	89.28 (25.20)
Nagapattinam	63.04 (8.14)	26.87 (3.67)	89.91 (11.63)	60.93 (9.29)	22.71 (9.40)	83.63 (16.72)	62.16 (10.22)	21.74 (10.72)	83.9 (19.41)
Namakkal	62.74 (6.73)	26.14 (3.53)	88.88 (9.79)	50.66 (20.48)	18.58 (11.01)	69.24 (30.81)	51.87 (22.78)	16.42 (13.17)	68.29 (34.25)
Perambalur	58.16 (3.6)	24.93 (1.54)	83.09 (5.14)	57.15 10.62)	18 (11.56)	75.15 (18.51)	61.48 (6.53)	17.39 (12.11)	78.87 (16.89)
Pudukkottai	66.24 (3.6)	15.91 (11.24)	82.15 (12.44)	63.55 (7.35)	21.61 (11.01)	85.16 (16.44)	65.67 (7.58)	24.46 (9.89)	90.14 (16.10)
Ramanathapuram	48.39 (10.70)	10.3 (10.69)	58.69 (18.53)	60.99 (6.81)	18.36 (11.04)	79.35 (16.70)	63.58 (6.69)	20.31 (10.14)	83.89 (15.97)
Ranipet	56.64 (8.22)	23.04 (4.81)	79.68 (12.29)	52.18 (15.18)	20.66 (7.91)	72.84 (22.66)	57.29 (17.60)	22.92 (8.81)	80.21 (26.03)
Salem	64.13 (8.7)	26.24 (6.02)	90.37 (13.02)	58.08 (15.11)	20.17 (11.28)	78.25 (24.62)	61.19 (12.46)	20.24 (11.65)	81.43 (22.06)
Sivaganga	59.22 (11.25)	24.46 (6.14)	83.68 (16.11)	55.2 (13.91)	19.84 (9.93)	75.04 (22.65)	51.98 (15.17)	16.38 (10.91)	68.36 (23.88)
Tenkasi	68.26 (2.16)	28.11 (2.18)	96.38 (3.93)	58.86 (15.07)	18.88 (11.04)	77.73 (23.97)	59.06 (17.42)	17.95 (10.54)	77.01 (26.16)
Thanjavur	64.84 (1.11)	27.09 (2.50)	91.92 (3.03)	67.39 (9.50)	17.56 (11.89)	84.96 (17.38)	66.98 (11.19)	18.93 (12.15)	85.91 (19.03)
The nilgiris	66.01 (3.35)	1.39 (3.43)	67.4 (4.79)	60.24 (10.35)	21.35 (9.38)	81.58 (17.51)	62.09 (10.30)	18.74 (12.16)	80.84 (19.73)
Theni	62.06 (7.18)	1.93 (5.19)	64 (9.29)	55.41 (14.53)	15.57 (11.69)	70.98 (23.26)	61.35 (14.30)	18.13 (11.81)	79.48 (23.18)
Thiruvallur	57.12 (16.22)	18.73 (11.33)	75.85 (24.47)	55.79 (14.95)	20.77 (9.00)	76.56 (22.64)	58.66 (16.60)	20.28 (10.70)	78.94 (25.56)
Thiruvarur	53.16 (9.79)	1.21 (3.57)	54.37 (10.17)	44.78 (19.95)	16.46 (10.61)	61.24 (29.79)	51.06 (22.17)	18.39 (12.19)	69.45 (33.18)
Tiruchirappalli	45.36 (15.36)	6.19 (7.00)	51.55 (17.78)	51.21 (14.60)	15.62 (10.73)	66.83 (22.63)	53.36 (13.34)	16.46 (9.99)	69.81 (20.66)
Tirunelveli	56.35 (8.20)	2.18 (4.30)	58.53 (7.39)	55.17 (13.12)	15.88 (10.85)	71.05 (21.02)	55.18 (15.51)	13.17 (11.51)	68.36 (23.98)
Tirupathur	64.08 (5.66)	25.71 (3.55)	89.79 (8.74)	53.67 (21.82)	21.86 (9.90)	75.53 (31.39)	57.45 (19.61)	21.63 (10.72)	79.08 (29.30)
Tiruppur	65.86 (3.59)	9.93 (11.45)	75.79 (9.60)	63.84 (4.50)	17.56 (11.46)	81.4 (13.16)	66.4 (3.68)	17.21 (11.17)	83.61 (13.55)
Tiruvannamalai	57.21 (12.48)	24.43 (5.40)	81.64 (17.84)	49.66 (15.85)	18.87 (8.98)	68.54 (23.52)	51.68 (20.58)	19.48 (11.30)	71.16 (30.98)
Tuticorin	59.15 (13.50)	0.85 (3.54)	59.99 (13.99)	55.63 (13.99)	17.31 (11.01)	72.95 (22.55)	56.76 (14.29)	16.49 (12.39)	73.25 (23.75)
Vellore	60.46 (9.22)	16.08 (10.37)	76.54 (15.12)	56.04 (11.75)	19.06 (9.53)	75.09 (18.79)	56.33 (18.29)	14.81 (12.22)	71.14 (27.95)
Villupuram	44 (16.41)	18.81 (7.04)	62.81 (23.45)	52.99 (10.89)	18.33 (10.03)	71.32 (18.36)	57.79 (10.38)	19.03 (11.40)	76.83 (20.40)
Virudhunagar	59.5 (12.40)	6.09 (6.84)	65.59 (15.80)	48.02 (19.04)	17.13 (10.61)	65.15 (28.34)	50.76 (18.56)	17.59 (11.15)	68.35 (28.18)
Total	**55.57 (19.36)**	**14.38 (12.63)**	**69.95 (27.23)**	**56.92 (15.23)**	**17.35 (11.33)**	**74.27 (23.79)**	**56.95 (17.48)**	**16.13 (12.32)**	**73.09 (26.97)**

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from 5.71 (± 10.89) for consistency and quality 2.42 (± 4.65) in 2021 to 55.57 (± 19.36) and 14.38 (± 12.63) in 2023. Similarly for P form Consistence and quality improved from 18.97 (± 17.99) and 7.85 (± 7.84) in 2021 to 56.92 (± 15.23) and 17.35 (± 11.33) in 2023. Similarly for L form Consistence and quality improved from 20.45 (± 2.13) and 8.5 (± 8.71) in 2021 to 56.95 (± 17.48) and 16.13 (± 12.32) in 2023. The progress in the performance is evident from the tables.

Table 3: S-form, P-form, and L-form performance over the years.

Year	Factors	S form reporting (n=10869)		P form reporting (n=5726)		L form reporting (n=4789)	
		Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
2021 to October 2023	Total Score	42.91 (21.07)	98	55.81 (24.39)	98	55.55 (27.83)	99
	Consistency	33.61 (14.67)	69	41.91 (15.94)	69	42.18 (18.28)	69
	Quality	9.31 (8.3)	29	13.89 (9.48)	29	13.36 (10.60)	30
2021	Total Score	8.14 (15.53)	94	26.82 (25.79)	98	28.95 (28.8)	98
	Consistency	5.71 (10.89)	66	18.97 (17.99)	69	20.45 (20.13)	69
	Quality	2.42 (4.65)	28	7.85 (7.84)	29	8.5 (8.71)	29
2022	Total Score	46.67 (28.62)	100	62.32 (30.75)	100	61.03 (33.55)	100
	Consistency	36.39 (20.73)	70	46.75 (21.52)	70	46.31 (23.42)	70
	Quality	10.28 (10.12)	30	15.58 (10.96)	30	14.73 (11.95)	30
2023	Total Score	69.95 (27.34)	100	74.27 (23.79)	100	73.09 (26.97)	100
	Consistency	55.57 (19.36)	70	56.92 (15.23)	70	56.95 (17.48)	70
	Quality	14.38 (12.63)	30	17.35 (11.33)	30	16.13 (12.32)	30

Table: 4 Number of outbreaks reported

Disease/ Illness	2021	2022	Upto October 2023
Acute Diarrhoeal Disease	13	17	14
Acute Gastro Enteritis/Food Borne Illness	1	0	5
Dengue	12	11	3
Diphtheria	5	2	2
Fever	3	3	0
Others / Food borne illness	6	28	9
Jaundice	1	1	4
Acute Hepatitis	0	0	2
JE	1	0	0
Leptospirosis	1	3	1
Mixed fever	4	5	0
Typhoid	2	0	0
Measles	0	1	4
Allergic Conjunctivitis	0	1	0
Chicken pox	0	13	15
Animal Bite - Dog Bite	0	0	1
Animal Bite - Others	0	0	1
ARI/Influenza Like Illness (ILI)	0	0	1
Cholera	0	0	5
Dysentery	0	0	1
Fever with Rash	0	0	6
Hepatitis A	0	0	3
Mumps	0	0	3
Only Fever < 7 days	0	0	9
Rubella	0	0	1
Scrub Typhus	0	0	1
TOTAL	**49**	**85**	**91**

Table 4 shows the number of outbreaks reported in IHIP-IDSP over the years. The early flagging of an event in the platform and conversion of the event into an outbreak over the years has been expressed. The trend of the outbreaks has varied since 2021 with acute diarrhoeal disease being the most common in 2021 to food borne illness in 2022 and chicken pox in 2023.

DISCUSSION

This study is the first of its kind in assessing a state's progress in IHIP-IDSP performance by the completion of S-form, P-form, L-form, mapping, case reporting and outbreak response. It shows the sectors where the performance of S/ P/ L form, Case reporting and Outbreak performance has been lacking in the state and the districts which have to be rectified to improve the performance. Over the years the performance has been increased in the IHIP-IDSP which probably could be due to the orientation training given to the stakeholders of the State and District surveillance unit and the transfer of that knowledge to the peripheral reporting units. Periodic refreshing training and weekly review and the knowledge and awareness could have played a major role in the improvement of the performances.

S-form performance has been improved over the years. The majority of the districts have been performing well in reporting of S-form with consistency while the quality of reporting has to be improved. The probability of poor performance in some districts could be due to the shortage of field staff due to superannuation or other administrative responsibilities. The poor performance noted in districts with major corporations are due to the lack of health subcentres where field staffs are available in the corporations. All districts are a combination of rural villages and urban corporations where some part of them (rural villages) update a part of the districts S form with exception of Chennai. Chennai corporation is a unique system, with no rural villages and affects the entire performance of the districts S form. For those districts, more emphasis has to be placed on identifying the right staff for reporting. In addition to replacing the deficiency of staff, improving the knowledge on the importance of updating the line list of cases identified in the field to improve the quality of reporting which on the other hand will help in identifying the impending outbreak is crucial. Consistency with the quality of reporting in S-form is of vital importance in solving the epidemiological challenge of the iceberg phenomenon.

P-form entry has also seen a remarkable improvement in the state. Compared to the S-form, P-form needs more time and knowledge on which disease should be considered in which category. This could be the reason for a lag in P-form performance compared to S-form performance. Most of the districts couldn't achieve their P-form performance similar to their S-form performance. P-form consistency is not equivalent with the S-form but the quality of P-form is above average and better than S-form as those reporting the P-form report the line list. Public and private institutions are included

in P-form reporting, which has proven difficult because most private institutions are either too small or too understaffed to devote the necessary staff to reporting the line list. In the same way, some government institutions are understaffed to maintain the P-form. In some public institutions, the change in the reporting person due to administrative reasons or due to a change in institution for educational reasons has been a major problem to be addressed.

L-form has also seen a remarkable improvement, but it has similar flaws to the P-form when compared to the S-form. Laboratory reporting of lab-confirmed cases is vital in the confirmation of disease diagnosis in taking appropriate measures to control the outbreaks. The consistency and quality of L-form reporting is similar to P-form. L-form reporting involves both public and private institutions and requires dedicated staff. Updating the results has been a hurdle to overcome in most reporting units which has to be managed with adequate staff, material resources and sensitization of the laboratories is vital.

As discussed in the reporting of S-form, P-form, and L-form updating the line list plays a major role in the performance. A line list helps to get a clear picture of the situation and the steps to be taken to prevent any outbreaks. Case reporting has seen steady progress in IHIP-IDSP with a gradual increase in line listing. The change in disease surveillance from IDSP to IHIP-IDSP is to get a quality line listing which was not available in IDSP where aggregate data was collected without the case details. More emphasis should be focussed on improving the knowledge and awareness about the vital role of line listing to the HCWs to reduce the hidden burden on them during outbreaks by preventing them.

Urban mapping was completed within a year of the initiation of IHIP-IDSP. Majority of the districts have completed their mapping while some corporations had issues in mapping. Certain major corporations had problems in urban mapping which has been addressed to the CSU and the progress is still in process which has further reduced the performance of few districts.

Outbreak response hasn't seen much progress as seen with other performance indicators. With changes in the definition and criteria for defining an outbreak, the flagging of an event has not seen a commendable improvement. The updating of RRT deployment, RRT composition and RRT updates are still inadequate in most events and outbreaks. Completion of line listing and update of the results of laboratory test is yet to reach the desired standards. In addition, DSO updates and timely completion of outbreaks is yet to be improved. With more awareness, the outbreak response can be improved to a benchmark level in the district which could also improve the state as a whole.

CONCLUSION

It's a cross-sectional study analysing secondary data extracted from IHIP-IDSP platform alone and HCWs direct participation was not a part of this study. The current evaluation of the monitoring of SSU over DSUs and DSUs over the HCWs from the peripheral reporting units were not collected. The current manpower in the DSUs and peripheral units were not collected and analysed. The comparison of the performance of IDSP before 2021 was not compared with the current IHIP-IDSP.

It is evident from the above findings that there is a scope for improvement in the performance of the state in IHIP-IDSP by improving the performance of districts. The major elements to be addressed in the districts are to improve the human resources in the peripheral reporting units, periodic refreshment training for the HCWs, and monitor their performance at timely intervals. All level reporting HCWs from the SSUs, DSUs and the peripheral reporting units should be allowed to provide periodic feedback on the hurdles in reporting. Frequent refreshing training for the HCWs from both public and private institutions with a pre- and post-training assessment is of utmost importance to maintain sustainable performance. The quality of training should be improved by emphasizing mock exercises and hands-on skills in reporting. Timely auditing of the resources available and the functionality of the resources to ensure efficient reporting is vital.

All DSUs should ensure that every HCW nominated for reporting in IHIP-IDSP is aware of the job responsibilities and they are properly trained in handling the platform. The SSUs should monitor the DSUs and provide training for the new HCWs recruited for the DSUs and refreshment training for the existing HCWs. Every DSU and SSU should have a dedicated RRT who will be ready to respond to any impending outbreak or existing outbreak and they should be aware of their role and responsibilities in IHIP-IDSP updating and the field activities.

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