

Advancements in Disease Surveillance and Data Coverage in Djibouti: A Commentary and Brief Overview

Sakarie Mustafe Hidig^{1*}, Charmarke Mahamoud Ibrahim², John Chisulo Phiri³

¹MBBS, MS, Ph.D^C Division of Hepatobiliary and Pancreatic Surgery, Department of Surgery, The Fourth Affiliated Hospital, Zhejiang University School of Medicine, Zhejiang Province, China

²MBBS, MMed, Department of Emergency, Peltier General Hospital, Djibouti University Hospital, Djibouti

³MBBS, Registrar General Surgery, Lewanika General Hospital, Mongu City, Zambia

Corresponding Author* Email: hidig2015@icloud.com

ABSTRACT

Abstract Epidemiological surveillance is an essential component of public health systems worldwide, serving as a cornerstone for effectively managing health issues by monitoring disease distribution and detecting potential epidemics at their earliest stages. In Djibouti, a country situated in the Horn of Africa, the National Institute of Public Health plays a crucial role in overseeing the surveillance of 35 notifiable diseases, meticulously analyzing trends, and confronting the challenges posed by emerging health threats. This literature review delves into the comprehensive analysis of epidemiological data from the year 2023, with a primary focus on identifying prevalent trends, assessing geographical distributions, and elucidating demographic patterns. Among the diseases frequently reported during this period were malaria, influenza-like illnesses, and acute diarrheal diseases, indicating their significance in the local health landscape. Data collection was conducted every week, employing a combination of active and passive surveillance methods across a network of healthcare facilities throughout Djibouti. Active surveillance involves proactive efforts to seek out cases through systematic monitoring, while passive surveillance relies on the voluntary reporting of cases by healthcare providers. The utilization of both methods ensures a comprehensive and nuanced understanding of disease dynamics within the population. The findings of this review underscore the importance of ongoing surveillance efforts in Djibouti and offer valuable insights into potential areas for improvement. Recommendations aimed at enhancing surveillance effectiveness include strengthening data collection mechanisms, improving reporting systems, and enhancing collaboration between healthcare facilities and public health authorities. By implementing these recommendations, Djibouti can further fortify its capacity for disease surveillance and response, ultimately leading to improved public health outcomes and the mitigation of health threats for its population. This study contributes to the broader discourse on epidemiological surveillance in resource-limited settings and underscores its critical role in safeguarding public health.

Keyword: - Djibouti, national surveillance, malaria, influenza, Vaccine, epidemiological data

1. INTRODUCTION

Epidemiological surveillance represents an essential pillar in managing health issues, playing a crucial role in describing the distribution of diseases, early detection of unexpected phenomena or potential epidemics, and assessing the effectiveness of preventive measures [1]. This system focused on the mandatory reporting of diseases (MDO), has a legally binding dimension for all healthcare professionals, whether they work in the public or private sector. In Djibouti, the National Institute of Public Health (INSPD) has established a carefully selected list of 35 diseases and health phenomena subject to national surveillance through its epidemiological surveillance section [2]. Thirteen of them require immediate reporting, while others are subject to weekly reporting. These data help document the frequency and geographical distribution of diseases, affecting all age groups and both sexes, with some constituting major public health problems in the country. In 2021, the total number of recorded cases was 103,912, and in 2022, it reached 167,536. Among the most frequently reported MDOs during these two years are malaria, influenza-like illness, and acute diarrheal diseases [3]. To provide a comprehensive perspective on the epidemiological situation for the year 2023, we will examine in detail the diseases subject to mandatory reporting, highlighting trends, challenges, and measures taken to control these health phenomena. In the relentless pursuit of enhancing healthcare systems, the past decade has witnessed significant strides in epidemiological surveillance activities. These advancements underscore a steadfast commitment to improving public health. Several pivotal steps have bolstered surveillance capabilities, ranging from updating and revising the list of diseases under surveillance to strengthening on-the-ground epidemiological expertise [4].

2. METHODOLOGY

In compiling this review article, we relied on 2023 government data, using publicly anonymous online available data, sourced primarily from key institutions such as government medical centers, the World Health Organization (WHO), the Field Epidemiology Training Program (FETP), the African Field Epidemiology Network (AFENET), and The Centers for Disease Control and Prevention (CDC). By integrating data from these diverse and reputable sources, our review article endeavors to offer a comprehensive and nuanced analysis of the prevailing health landscape, facilitating informed decision-making and proactive strategies in combating pressing health challenges.

3. RESULTS

Sustained efforts have been made to update and revise the list of diseases subject to surveillance. This proactive approach demonstrates a willingness to adapt to epidemiological shifts and ensure comprehensive coverage of priority health phenomena [5]. An important initiative has been the training of epidemiological focal points on the ground. Conducted in partnership with AFENET, this action has enhanced local competencies in epidemiological surveillance [6]. These focal points, now better equipped to detect, report, and respond to epidemiological situations, significantly contribute to the effectiveness of the surveillance system. Emphasis on training professionals in epidemiology on the ground has created a more informed, responsive workforce capable of anticipating emerging challenges. These advancements showcase a continued commitment to enhancing epidemiological surveillance capacities, thereby bolstering the resilience of the healthcare system against evolving threats [7]. The combination of an updated disease list, competent focal points, and fruitful collaborations establishes a robust foundation for effective epidemiological surveillance in the coming decade [8].

Table 1: Evolution stages of diseases under surveillance over the past 10 years.

Years	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Disease under surveillance	Review list of MDOs								Review list of MDOs			
	12 MDO	20 MDO							35 MDO			
Completion rate	49%							60%	87%	90%		

Table 2: Data coverage for the year 2023.

Health Structure	Number of reports expected	Number of Reports received on time	Total number of reports received	Promptness	Completeness
DJIBOUTI-Ville	1820	1450	1508	80%	83%
ALI-SABIEH	468	468	468	100%	100%
ARTA	520	515	515	99%	99%
DIKHIL	468	461	467	99%	100%
OBOCK	364	274	291	75%	80%
TADJOURAH	624	609	609	98%	98%
DJIBOUTI-PAYS	4264	3777	3858	88,6%	90,5%

Epidemiological surveillance in 2023 demonstrates robust overall performance, with most healthcare structures exhibiting strong timeliness and completeness in report submissions. These positive results indicate increased adherence to reporting standards and an overall improvement in data collection practices [9]. Figures reveal a positive trend, highlighting overall improvement compared to previous years [Table 1]. This evolution underscores ongoing efforts to strengthen the effectiveness of the epidemiological surveillance system. Further analysis suggests opportunities for improvement in healthcare structures in OBOCK, particularly concerning timeliness (75%) and completeness (80%) of reports [Table 2].

Table 3: Distribution of VTE cases by region.

Diseases	Djibouti-ville	Ali-Sabieh	ARTA	Dikhil	Obock	Tadjourah	Total

	Case	Death	C	D										
COVID-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute Flaccid Paralysis	2	0	2	0	1	0	7	0	1	0	8	0	21	0
Neonatal tetanus	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Measles	224	0	7	0	18	2	97	1	21	1	114	3	48	7
Yellow fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Cases of acute flaccid paralysis are recorded across all regions, with Djibouti-Ville reporting the highest number, totaling 2 cases [Table 3]. A single case of neonatal tetanus has been reported in Djibouti-Ville. Measles prevalence is notable, with Djibouti-Ville recording the highest number of cases, totaling 224. Measles-related deaths are reported, mainly in Tadjourah with 3 deaths, followed by Djibouti-Ville with 2 deaths [10].

4. Measles

In 2023, Djibouti reported 488 suspected measles cases, with an incidence rate of 40.03 per 100,000 population, resulting in 74 lab-confirmed cases and 8 deaths. Compared to the previous year, suspected cases decreased by 19%, indicating improved disease management [11]. The highest case counts were in Djibouti-Ville (224), Tadjourah (117), and Dikhil (98), primarily affecting ages 1-4 (214 cases) and 15+ (106 cases), with males predominating (255 cases). Epidemiological analysis showed a peak in May 2023, contrasting with October 2022, signaling a shift in disease dynamics. Since September 2023, cases have gradually decreased, possibly due to interventions like vaccination campaigns [12]. The age distribution emphasizes the vulnerability of young children, necessitating early vaccination. Geographic analysis highlights Djibouti-Ville and Tadjourah as high-prevalence areas. Out of 488 cases, 116 were investigated with blood sampling, confirming 74 as measles positive. Thorough investigation and analysis of all suspected cases are essential for reliable epidemiological data and understanding of measles spread [13].

4.1 Acute Flaccid Paralysis

The eradication of poliomyelitis remains a major priority in Djibouti. The last case of paralytic polio was reported in 1999, marking significant progress towards the elimination of this disease. However, in 2023, a concern arose with the observation of 21 cases of acute flaccid paralysis (AFP). It is important to note that AFP can be caused by various pathogens, with poliomyelitis being a major concern. The geographical distribution of these cases highlights a significant concentration in the north of the country, particularly in Tadjourah (8 cases), and in the south in Dikhil

(7 cases). This worrying distribution necessitates a rapid and targeted response in these regions to prevent potential poliomyelitis spread. Despite the absence of cases of paralytic polio since 1999, continued vigilance and sustained implementation of vaccination programs are essential to maintain polio eradication in Djibouti [14].

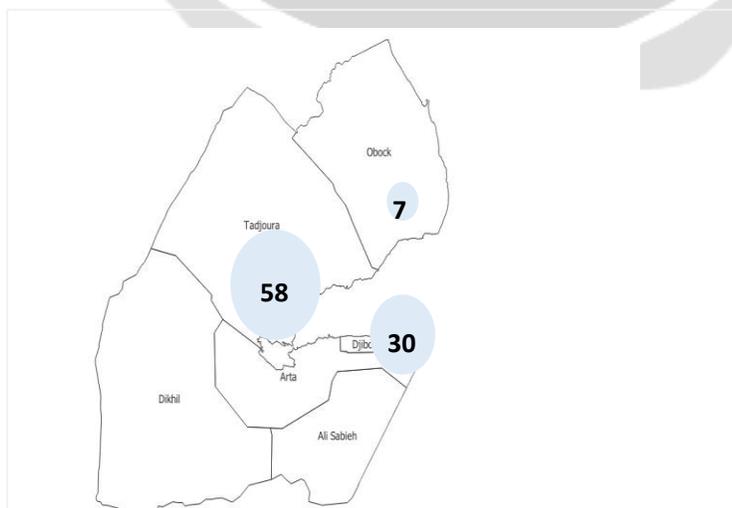
Table 4: Distribution of cases of syndromic diseases according to regions

Diseases	Djibouti-Ville		Ali-Sabieh		Arta		Dikhil		Obock		Tadjourah		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	C	D
Bloody Diarrhea	852	0	53	0	67	0	521	0	264	0	301	0	2058	0
Acute Watery Diarrhea	26467	1	2635	0	2517	0	3227	1	1653	2	1376	0	37875	4
Syndrome flu	30431	0	3749	0	3426	0	1308	0	3314	0	7330	0	49558	0

High prevalence of bloody diarrhea was noted in Djibouti-Ville (852 cases) and Dikhil (521 cases). Djibouti-Ville also reports a significant incidence of acute watery diarrhea (26,467 cases) and influenza-like illness (30,431 cases), with notable occurrences in Tadjourah and Ali-Sabieh as well [Table 4].

In Djibouti, there were 37,875 cases of acute watery diarrhea reported, a slight increase from the previous year's 37,237 cases. Brucellosis reporting is now mandatory, with 970 cases recorded in the past year, mainly in Tadjourah, Djibouti City, and Obock. Road accidents totaled 3,323 cases in 2023, a 5% rise from the prior year, with Djibouti City representing 86% of incidents, signaling a need for improved road safety measures there [Fig 1].

Fig 1 Weekly evolution of the number of human Brucellosis cases for the year 2023



5. Discussion

In its quest for enhanced public health outcomes, Djibouti has demonstrated remarkable progress in bolstering its epidemiological surveillance system. Our comprehensive review article delves into the transformative journey of disease surveillance, data coverage, vaccine-preventable illnesses, and syndromic surveillance throughout the year 2023[15]. A pivotal insight gleaned from our analysis is the persistent endeavor to broaden the spectrum of monitored diseases, alongside noticeable enhancements in completion rates. These improvements signify a proactive stance in adapting to evolving epidemiological trends. Furthermore, our scrutiny of data coverage indicates a commendable advancement in the prompt and comprehensive reporting from healthcare facilities, reflecting an overarching enhancement in adherence to reporting protocols. Nevertheless, discernible regional variances underscore the imperative for targeted interventions in regions with deficient reporting rates. Notably, vaccine-preventable diseases such as measles and acute flaccid paralysis persist as significant concerns, necessitating continuous efforts in disease control and vaccination initiatives [16]. Syndromic surveillance brings to light the prevalence of ailments like diarrhea and influenza-like illness, underscoring the necessity for sustained monitoring and response strategies. The recommendations delineated in our article furnish a strategic blueprint for fortifying Djibouti's epidemiological surveillance apparatus. Vital measures such as capacity augmentation, surveillance expansion, digital infrastructure development, and international cooperation emerge as imperative strides towards fostering improved public health outcomes [17]. Djibouti's unwavering commitment to bolstering epidemiological surveillance serves as a cornerstone of effective public health governance. By implementing the proposed strategies, Djibouti stands poised to erect a more resilient healthcare framework capable of promptly detecting, responding to, and mitigating emergent health hazards, thereby safeguarding the populace's well-being [18].

6. Recommendations

- **Capacity Strengthening:** Enhanced training of healthcare personnel for early detection and rapid notification of diseases.
- **Surveillance Expansion:** Integration of Acute Respiratory Illnesses (ARI) surveillance for effective prevention.
- **Digital Platform:** Development of a centralized digital platform for efficient data collection and analysis.
- **Diversification of Surveillance:** Integration of Antimicrobial Resistance (AMR) surveillance to anticipate increased risks.
- **Specialized Training:** Training programs for epidemiologists on vaccine-preventable diseases and AMR surveillance.
- **Laboratory Strengthening:** Investment in equipment and training for rapid diagnostic confirmation.
- **Expansion of Disease Range Under Surveillance:** Integration of surveillance for non-communicable diseases for a holistic view of public health.
- **International Coordination Strengthening:** Collaboration with international agencies for cross-border surveillance.
- **Telehealth Integration:** Development of solutions for remote surveillance and rapid response.
- **Early Warning System Strengthening:** Implementation of multi-indicator-based systems to anticipate epidemics.

7. Conclusion

In 2023, the epidemiological surveillance efforts in Djibouti unveiled a nuanced picture, showcasing both strides forward and lingering hurdles in the realm of public health. This analysis underscored the critical need for the nation to embrace strategic measures across short-, medium-, and long-term horizons, thereby fortifying its epidemiological surveillance framework and more effectively tackling evolving health crises. The formulation and implementation of strategic recommendations are poised to play a pivotal role in elevating Djibouti's public health landscape. In the short term, immediate actions can be taken to bolster surveillance mechanisms, enhance data collection and analysis, and reinforce communication channels within the healthcare infrastructure. Medium-term strategies may encompass the establishment of robust training programs to equip healthcare professionals with specialized skills in epidemiology and disease detection, as well as the integration of innovative technologies to streamline surveillance processes and facilitate real-time data monitoring. Looking towards the long term, sustained commitment to innovation, capacity-building, and international collaboration emerges as paramount. Djibouti must foster an environment conducive to innovation, leveraging cutting-edge technologies such as artificial intelligence and predictive analytics to anticipate and mitigate health threats proactively. Moreover, investing in the continuous education and professional development of its healthcare workforce will be instrumental in cultivating a cadre of experts capable of navigating complex epidemiological challenges. International collaboration stands as a cornerstone of Djibouti's efforts to fortify its epidemiological surveillance apparatus. By forging partnerships with regional and global health organizations, sharing best practices, and participating in joint research initiatives, Djibouti can harness collective expertise and resources to safeguard the health and well-being of its populace effectively. The roadmap for enhancing epidemiological surveillance in Djibouti necessitates a multifaceted approach encompassing strategic planning, technological innovation, human capacity development, and international cooperation. By steadfastly committing to these principles, Djibouti can pave the way towards a resilient and responsive public health system capable of confronting emergent epidemiological challenges with confidence and efficacy.

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Abbreviations

INSPD The National Institute of Public Health

MDO Mandatory reporting of diseases

AFP Acute flaccid paralysis

AFENET African Field Epidemiology Network

AMR Antimicrobial Resistance

ARI Acute Respiratory Illnesses

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BIOGRAPHIES

	<p>Sakarie Mustafe Hidig, MBBS,MS,Ph.D^c is a distinguished general surgeon currently affiliated with the Department of General Surgery, specializing in Hepatobiliary and Pancreatic Surgery at the Fourth Affiliated Hospital of Zhejiang University School of Medicine. He holds memberships in esteemed organizations such as the China Medical Association (CMA), the Somali Medical Association (SMA), and the Scholars Academic and Scientific Society (SAS), among others. Additionally, Dr. S.M.H is recognized as a regular fellow of (IOASD).</p>
	<p>Charmarke Mahamoud Ibrahim MBBS,MMed, is a dedicated healthcare professional serving in the emergency department of Peltier General Hospital, which is affiliated with Djibouti University Hospital. With a passion for providing timely and compassionate care to patients in critical situations, Charmarke plays a vital role in ensuring that individuals receive the urgent medical attention they need.</p>
	<p>John Chisulo Phiri MBBS, is a dedicated medical professional serving as the Registrar General Surgery at Lewanika General Hospital. With a passion for healing and a commitment to excellence, John has made significant contributions to the field of surgery.</p>