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ORIGINAL

Development and Use of Endemic Channels for Diagnostic and Preventive Purposes in Health Decision-Making

Desarrollo y uso de canales endémicos con fines diagnósticos y preventivos en la toma de decisiones sanitarias

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ABSTRACT

This theoretical-practical study presents the conceptual and methodological foundations for the construction and application of endemic corridors as a diagnostic and prevention tool in public health decision-making. The work highlights the central role of statistics and graphical representation in the interpretation of health phenomena, allowing for an understanding of the dynamics of the health-disease process in specific populations and strengthening epidemiological surveillance strategies. The endemic corridor is defined as an analytical tool that uses historical incidence data to establish expected patterns of occurrence of health events in a given period. Based on the analysis of time series—ideally five to seven years—a historical mean line is calculated and quartiles are determined that allow different zones of epidemiological behavior to be delimited: success or control zone, endemic or safety zone, alert zone, and epidemic zone. This segmentation facilitates the early identification of anomalous variations in the incidence of health events. As a practical application, the study uses the event "patient falls" in a second-level hospital as a unit of analysis, considering its relevance as an indicator of quality of care along with variables such as mortality, hospital stay, and readmissions. By organizing monthly data, calculating averages and medians, and determining quartiles, an endemic corridor is constructed that allows trends to be evaluated and reliable situational diagnoses to be established. The results show that this tool is an accessible and effective resource for healthcare professionals, facilitating the identification of risks, the planning of preventive interventions, and the continuous improvement of healthcare quality.

Keywords: Endemic Corridor; Epidemiological Surveillance; Health Statistics; Patient Safety; Healthcare Management.

RESUMEN

Este estudio teórico-práctico presenta los fundamentos conceptuales y metodológicos para la construcción y aplicación de corredores endémicos como herramienta de diagnóstico y prevención en la toma de decisiones en salud pública. El trabajo destaca el papel central de la estadística y de la representación gráfica en la interpretación de los fenómenos sanitarios, permitiendo comprender la dinámica del proceso salud-enfermedad en poblaciones específicas y fortalecer las estrategias de vigilancia epidemiológica. El corredor endémico se define como un instrumento analítico que utiliza datos históricos de incidencia para establecer patrones esperados de ocurrencia de eventos sanitarios en un período determinado. A partir del análisis de series temporales —idealmente de cinco a siete años— se calcula una línea media histórica y se determinan cuartiles que permiten delimitar diferentes zonas de comportamiento epidemiológico: zona de éxito o control, zona endémica o de seguridad, zona de alerta y zona epidémica. Esta segmentación facilita la identificación temprana de variaciones anómalas en la incidencia de eventos de salud. Como aplicación práctica, el estudio utiliza el evento "caídas de pacientes" en un hospital de segundo nivel como unidad de análisis, considerando su relevancia como indicador de calidad asistencial junto con variables como mortalidad, estancia hospitalaria y reingresos. Mediante la organización de datos mensuales, el cálculo de promedios y medianas, y la determinación de cuartiles, se construye un corredor endémico que permite evaluar tendencias y establecer diagnósticos situacionales confiables. Los resultados evidencian que esta herramienta constituye un recurso accesible y eficaz para profesionales de la salud, facilitando la identificación de riesgos, la planificación de intervenciones preventivas y la mejora continua de la calidad del cuidado sanitario.

Palabras clave: Corredor Endémico; Vigilancia Epidemiológica; Estadística en Salud; Seguridad del Paciente; Gestión Sanitaria.

INTRODUCTION

At present, representative graphics and statistical science play a fundamental role in understanding health phenomena. The health problems of the population can be better interpreted through statistical data and charts that illustrate this process.[1] Thus, both descriptive and inferential statistics can account for real and potential problems related to population health. Taking epidemiology into consideration—as the science that studies the causality of diseases in populations—graphics and statistics are vital when elaborating mathematically precise diagnoses of population health. The health–disease process thus becomes a visible and understandable element not only for health professionals but also for the general population. Specifically, in reference to the field of epidemiology and with respect to the preventive tasks carried out by this science, both graphics and statistics are essential for performing surveillance activities. Both for known diseases or processes and for newly emerging phenomena in the health field that could give rise to epidemics.[2,3,4,5,6] In this article, we describe how to generate an endemic corridor (also called an endemic channel), which relies on graphics and statistics, with the purpose of showing its effectiveness as one of the main tools available in epidemiological surveillance. Let us recall that this work allows us to measure the speed of phenomena or incidence while simultaneously segmenting their magnitude or prevalence.

Endemic channels can alert us not only to health issues related to all types of pathologies but also to situations associated with adverse events, making them irreplaceable tools when making decisions in hospital or ministerial settings.[7]

For this article, we have conceived it with reference to the second example, taking as the axis the event "patient falls."

Theoretical Basis

Endemic corridors use statistics to construct representative data on the incidence of the health-disease process, understanding that such incidence refers to the number of new cases in relation to those already existing in a given place and time.[8]

For this reason, these graphs are fundamentally used for epidemiological surveillance. As background, endemic corridors began to be used more frequently at the end of the 20th century, specifically during the 1980s and 1990s, for transmissible and acute diseases such as influenza, yellow fever, and cholera, later joined by Dengue and Chikungunya.[9,10]

Nevertheless, endemic corridors or channels also allow us to construct—based on the collection of statistical data—other graphs related to different adverse events, such as patient falls, needlestick injuries, medication administration errors, proliferation of multidrug-resistant germs (MDR), etc. To establish a reliable graph of the object of study (diseases, events, etc.), the occurrence of the phenomenon must be considered for at least the past five years, although ideally, the last seven should be considered.[11]

Each year will show the incidence of the phenomenon segmented into time units: by day, week, month, and quarter, depending on the speed of the phenomenon. Consequently, the time unit is determined by the phenomenon or object of study.[12,13]

The collection of data for each time period, whether five or seven years are taken for the task, simultaneously implies that we are designing a particular epidemiological curve for each period.[8] Notably, the epidemiological calendar must be used for the construction of the corridor and the curves.[14] Suppose that our corridor arises from the collection of data from the past seven years and that the incidence of attack in which we have segmented the year is monthly, thus allowing us to obtain the arithmetic mean.[15]

The resulting graph will be called the "endemic mean line," enabling us to know the number of "expected" cases.

The mean line is the historical average of the cases.

If the number of cases is below the mean line, it is interpreted as a phenomenon of low incidence; in contrast, if the number of cases exceeds the mean line, we are facing a phenomenon of high incidence that may indicate the presence of an epidemic outbreak.

The above refers to the endemic curve or endemic mean line.

Returning to the corridor, it can also be interpreted through four well-defined segments:[16]

a) Success zone: cases are within the expected incidence or below it.

b) Safety or endemic zone: the number of cases does not exceed the mean line, indicating normal or historical disease behavior.

c) Alert zone: cases that exceed the mean line and approach the upper limit of the corridor, which requires the reinforcement of all epidemiological surveillance measures.

d) Epidemic zone: the number of cases exceeds the upper course of the mean line, placing us within an epidemic outbreak zone. This occurs because of an unusual increase in incidence.

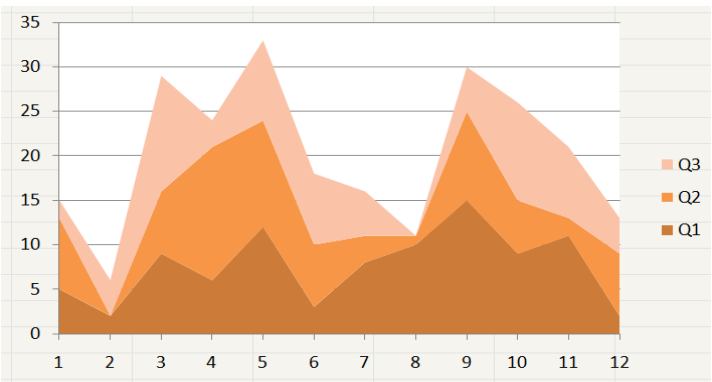

Figure 1. Endemic corridor

As we can see, the endemic corridor is a graphic tool based on highly useful statistical data within the health field.

In the following figure, the different areas that make up the endemic corridor can be observed.

Each segment is represented by a quartile (Q) of the data obtained. For this example, the quartiles are the three values that divide a dataset into a chart that consists of four equal parts.

DEVELOPMENT

On the basis of the theoretical framework presented, we develop a pertinent methodology to begin constructing an endemic corridor using seven years of data collection, with our object of study or unit of analysis being the event "patient falls."

This event is among the most important indicators when evaluating the quality of medical services provided by a healthcare institution, along with the length of stay, mortality rate, and readmission rate.

For example, we use a dataset spanning from 2019 through 2025, with the incidence rate defined as the number of events (cases) per month, as shown in the following figure.

One can observe the raw data output, without any type of ordering except for the year or month of occurrence.

Nevertheless, the dataset allows us to establish the monthly and yearly averages and construct the endemic mean line, which already enables us to outline an initial health diagnosis.

Number of Cases by Year and Month

NÚMERO DE CASOS POR AÑO Y MES												
AÑO	ENERO	FEBRERO	MARZO	ABRIL	MAYO	JUNIO	JULIO	AGOSTO	SETIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE
2019	23	28	10	15	16	24	8	11	20	3	16	14
2020	15	18	18	4	8	4	15	19	21	30	32	27
2021	20	23	13	9	11	17	24	36	30	22	15	16
2022	4	9	7	16	21	23	17	25	31	30	30	7
2023	0	1	8	12	13	24	25	20	27	14	9	11
2024	17	17	23	40	38	35	20	25	16	15	7	11
2025	12	16	20	23	14	9	11	7	3	0	9	11
MEDIA	13	8,6	14,14	17	17,28	19,42	17,14	20,42	21,14	16,28	16,85	13,85

Figure 2. Number of Cases by Year and Month

The second step we perform is to obtain the medians by month, for which we begin by ordering all the collected data from highest to lowest, as shown in the following graph.

Ordering the Number of Cases (per month) From Highest to Lowest

ORDENAMIENTO DEL NÚMERO DE CASOS (POR MES) DE MAYOR A MENOR												
AÑO	ENERO	FEBRERO	MARZO	ABRIL	MAYO	JUNIO	JULIO	AGOSTO	SETIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE
2019	23	28	23	40	38	35	25	36	31	30	32	27
2020	20	23	20	23	21	24	24	25	30	30	30	16
2021	17	18	18	16	16	24	20	25	27	22	16	14
2022	15	17	13	15	14	23	17	20	21	15	15	11
2023	12	16	10	12	13	17	15	19	20	14	9	11
2024	4	9	8	9	11	9	11	11	16	3	9	11
2025	0	1	7	4	8	4	8	7	3	0	7	7

Figure 3. Ordering the Number of Cases (per month) From Highest to Lowest

The next step, once our data have been arranged from highest to lowest, is to establish the quartiles (Q-1, Q-2, and Q-3).

Obtaining the Medians to Establish the Quartiles Q1, Q2, AND Q3

OBTENCIÓN DE LAS MEDIANAS PARA ESTABLECER LOS CUARTILES Q1; Q2 Y Q3														
AÑO	ENERO	FEBRERO	MARZO	ABRIL	MAYO	JUNIO	JULIO	AGOSTO	SETIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE	CUARTILES	Q
2019	23	28	23	40	38	35	25	36	31	30	32	27		
2020	20	23	20	23	21	24	24	25	30	30	30	16	MEDIANA	Q3
2021	17	18	18	16	16	24	20	25	27	22	16	14		
2022	15	17	13	15	14	23	17	20	21	15	15	11	MEDIANA	Q2
2023	12	16	10	12	13	17	15	19	20	14	9	11		
2024	4	9	8	9	11	9	11	11	16	3	9	11	MEDIANA	Q1
2025	0	1	7	4	8	4	8	7	3	0	7	7		

Figure 4. Obtaining the Medians to Establish the Quartiles Q1, Q2, AND Q3

Once the quartiles have been obtained, we can now simplify our data chart by leaving only another one that corresponds exclusively to the quartiles, as shown in the following graph.

CUARTILES	ENERO	FEBRERO	MARZO	ABRIL	MAYO	JUNIO	JULIO	AGOSTO	SETIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE
PRIMER Q	20	23	20	23	21	24	24	25	30	30	30	16
SEGUNDO Q	15	17	13	15	14	23	17	20	21	15	15	11
TERCER Q	4	9	8	9	11	9	11	11	16	3	9	11

Figure 5. Quartiles

Once the graph corresponding to quartiles 1, 2, and 3 has been obtained, we can develop the final chart, which will be none other than our endemic corridor, as shown in the following figure.

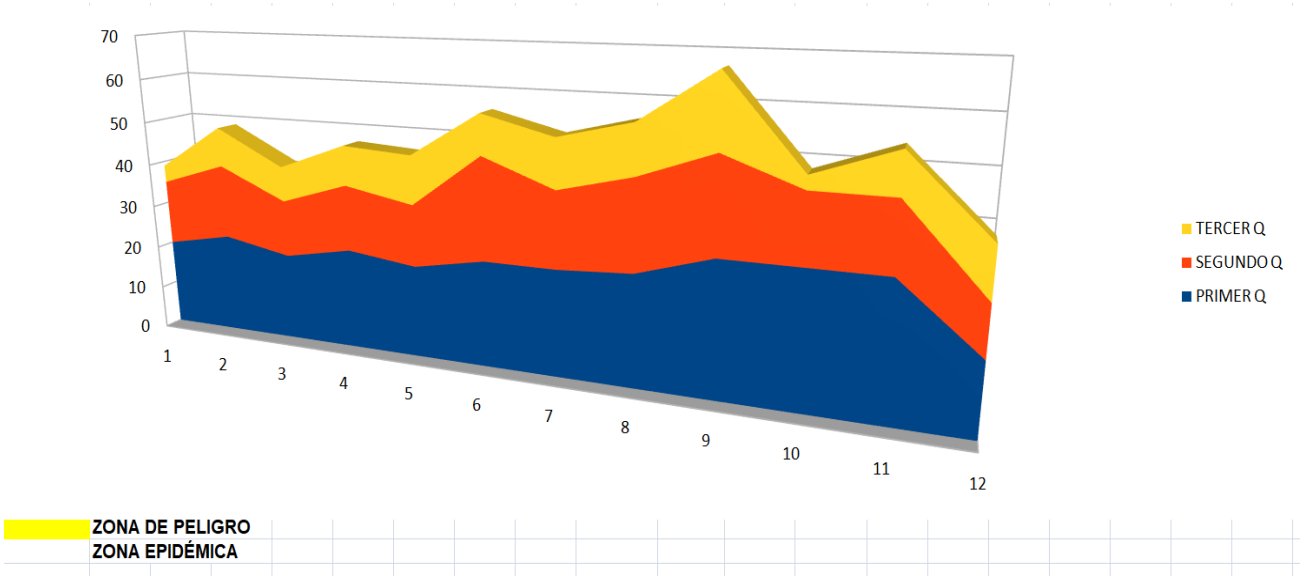

Figure 6. Endemic corridor

In this figure, which represents the endemic corridor, the four zones can be visualized. In blue, our zone of success or safety; in orange, the safety or endemic zone; in yellow, the alert zone; and in white, above the previous zone, the epidemic zone. In this way, we can establish a safe and reliable graph, supported by the statistical data collected over the past seven years.

CONCLUSIONS

As the reader may appreciate, the use of an endemic corridor allows us to assess many health-related variables, ranging from strictly epidemiological aspects to levels of management and the quality of care provided to the population.

We reviewed its basic foundations and, in a practical way, how to construct them. The knowledge required for this is simple and does not demand advanced statistical expertise. One only needs to understand the measures of central tendency (MCT), particularly the mean and the media.

Thus, the endemic corridor becomes an indispensable tool for healthcare professionals, whether nurses, physicians, dentists, or other disciplines. Moreover, this type of tool enables us to "contextualize" phenomena related to the health–disease process.

This process is not only complex but also highly dynamic and constantly evolving medical science cannot be overlooked. From an epidemiological perspective, the evolution of phenomena is tied to the social world surrounding them, expressed according to social behavior, customs, values, and geography.

This means that the endemic corridor is a radiograph of the social and geographical field that contains it, which is precisely what enhances its effectiveness.

Consequently, the use of an endemic corridor allows us, first and foremost, to assess a situational diagnosis. In our example, the number of patients falls within a medium-complexity or second-level hospital.

Once this evaluation is carried out and on the basis of that diagnosis, we can understand the causes of the phenomenon—such as patient classification, underlying pathologies, characteristics of hospitalization units, sufficient/insufficient staffing, staff expertise, and the existence/use of protocols—and then move on to correct the detected deficits.

The work is not simple, but it is grounded in solid scientific bases, which enables us to move closer to successful outcomes.

FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHORSHIP CONTRIBUTIONS

Conceptualization: Adrián Norberto de Paúl.
Data curation: Adrián Norberto de Paúl.
Formal analysis: Adrián Norberto de Paúl.
Writing – original draft: Adrián Norberto de Paúl.
Writing–review and editing: Adrián Norberto de Paúl.

BIBLIOGRAPHIC REFERENCES

1. Bortman M. Elaboración de corredores o canales endémicos mediante planillas de cálculo. Informe especial. 2006.

2. Orellano PW. Corredores endémicos y vigilancia epidemiológica: aplicaciones en enfermedades transmisibles. Rev Salud Pública (Bogotá). 2012;14(2):301–7.

3. Rial MJ, Alarcón N, Ferrario C, Szefner M, Califano G. Corredores endémicos: Una herramienta útil para la vigilancia epidemiológica de la influenza. Rev Argent Microbiol. 2008;40(1):21–6.

4. Reynoso JI. Aplicación de corredores endémicos en la vigilancia de dengue en Argentina. Rev Panam Salud Publica. 2013;33(5):370–5.

5. Rial MJ. Utilidad de los corredores endémicos en la vigilancia de enfermedades respiratorias pediátricas. Rev Hosp Niños Buenos Aires. 2009;81(3):210–5.

6. Ferrario C, Szefner M. Corredores endémicos aplicados a la vigilancia hospitalaria de influenza. Rev Argent Microbiol. 2008;40(1):2.

7. Bortman M. Corredores endémicos acumulativos: una propuesta metodológica para eventos de baja incidencia. Salud Colectiva. 2007;3(2):145–52.

8. Orellano PW, Reynoso JI. Nuevo método para elaborar corredores endémicos. Rev Panam Salud Publica. 2011;29(5):309–14.

9. Barbosa TCP, Do Nascimento GLM, Arroyo LH, Arcêncio RA, de Oliveira VC, Guimarães EAA. Geopharmacosurveillance of reporting rates of events supposedly attributable to vaccination or immunization against COVID-19. Revista Latino-Americana de Enfermagem 2025;33. https://doi.org/10.1590/1518-8345.7509.4539.

10. Vogazianos P, Argyropoulos CD, Haralambous C, Mikellidou CV, Boustras G, Andreou M, et al. Impact assessment of COVID-19 non-pharmaceutical interventions in long term care facilities in Cyprus: Safety improvement strategy. Safety Science 2021;143. https://doi.org/10.1016/j.ssci.2021.105415.

11. Alves H, Domingos LMG. Management adverse events following immunization for nursing team: Care challenges. Revista Enfermagem 2013;21:502–7.

12. Castro-Sánchez E, Gilchrist M, Ahmad R, Courtenay M, Bosanquet J, Holmes AH. Nurse roles in antimicrobial stewardship: Lessons from public sectors models of acute care service delivery in the United Kingdom. Antimicrobial Resistance and Infection Control 2019;8. https://doi.org/10.1186/s13756-019-0621-4.

13. Henrique DM, Barreto SCFSM, Camerini FG, Fassarella CS, Shutz V, Alves JR. Quality improvement project to reduce infection indicators in intensive care. Revista Gaucha de Enfermagem 2025;46. https://doi.org/10.1590/1983-1447.2025.20240126.en.

14. Costa NMN, Leão AMM. Reported cases of adverse events following immunization: Contribution to nursing care. Revista Enfermagem 2015;23:297–303. https://doi.org/10.12957/reuerj.2015.14850.

15. Geller AI, Budnitz DS, Dubendris H, Gharpure R, Soe M, Wu H, et al. Surveillance of COVID-19 Vaccination in Nursing Homes, United States, December 2020–July 2021. Public Health Reports 2022;137:239–43. https://doi.org/10.1177/00333549211066168.

16. Lugo MS, Pérez YM, Hernández MM. Theoretical Foundations Supporting Surveillance of Adverse Events in Pediatric Intensive Care. Revista Cubana de Enfermeria 2024;40.