Special article

Innovation and leadership in public health: The experience of the first National Mental Health Survey in El Salvador

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Abstract

Introduction. In El Salvador, there was a need to establish indicators that could provide an overview of the population's mental health status. In response, the National Institute of Health led the implementation of the first National Mental Health Survey, becoming a pioneering effort in interinstitutional collaboration. This article documents the full scope of the first National Mental Health Survey experience, from its conception and methodological and operational design to fieldwork execution and the lessons learned throughout the process. **Results.** A total of 6837 households participated, yielding a response rate of 82.9%. Response rates varied across age groups and by sex: adolescents (63.5 %) and older adults (64.0 %) demonstrated lower levels of participation, as did adult men. These disparities posed challenges to representativeness and raise important considerations regarding potential barriers to participation. The implementation strategy integrated digital data collection tools, intensive training of field personnel, and close collaboration with local communities and institutions, which helped to overcome logistical barriers and foster trust at the community level. **Conclusion.** The first National Mental Health Survey establishes a robust baseline of mental health indicators to inform public policy and program development. The experience demonstrates that high-quality data can be produced in resource-limited settings through technical leadership, strategic partnerships, and strong institutional commitment, offering a replicable model for national mental health surveillance in similar contexts.

Keywords
Mental Health, Health Care Surveys, Health Planning.

Resumen

Introducción. En El Salvador, existía la necesidad de obtener indicadores que permitieran conocer el panorama del estado de salud mental de la población. En respuesta, el Instituto Nacional de Salud lideró la implementación de la primera Encuesta Nacional de Salud Mental, un esfuerzo pionero y de articulación interinstitucional. Este artículo documenta la experiencia completa de la primera Encuesta Nacional de Salud Mental desde su concepción, diseño metodológico y operativo, hasta la ejecución en campo y los aprendizajes derivados del proceso. **Resultados.** Participaron 6837 hogares con una tasa de respuesta del 82,9 %. Las tasas de respuesta variaron entre grupos de edad y según sexo: adolescentes (63,5 %) y adultos mayores (64,0 %) mostraron menores niveles de respuesta, al igual que los hombres en grupos adultos. Estas diferencias plantearon retos para la representatividad y abren interrogantes sobre los factores que podrían influir en la participación. La implementación de la primera Encuesta Nacional de Salud Mental, incorporó herramientas digitales para levantamiento de datos, una formación intensiva del personal y el trabajo conjunto con comunidades y colaboración institucional en todos los niveles, que permitió superar desafíos logísticos y fortalecer la confianza local. **Conclusión.** La primera Encuesta Nacional de Salud Mental constituye una línea base de indicadores para la formulación de políticas de salud mental, la cual la convierte en un precedente para futuras investigaciones de carácter nacional. La experiencia de la encuesta demuestra que es posible generar datos de alta calidad en contextos de recursos limitados, mediante liderazgo técnico, alianzas estratégicas y compromiso institucional.

Palabras clave
Salud Mental, Encuestas de Atención de la Salud, Planificación en Salud.

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Innovación y liderazgo en salud pública: experiencia de la primera Encuesta Nacional de Salud Mental en El Salvador

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Introduction

Over the past two decades, the importance of mental health has been recognized worldwide, both at the individual level and for the development of societies. Recent epidemiological evidence documents excess mortality and reduced life expectancy among people with mental disorders: in a population cohort, combinations of mental disorders were associated with a reduction in re life expectancy ranging

from 5.06 to 17.46 years, depending on the diagnostic combination.[1] Additionally, for severe mental disorders, adjusted relative risks of all-cause mortality have been calculated at 2.89 for schizophrenia and 2.51 for bipolar disorder.[2]

Furthermore, in 2019, mental disorders accounted for 418 million disability-adjusted life years (DALYs) worldwide, corresponding to 16 % of the total global burden.[3]

In 2019, approximately 970 million people worldwide were living with a mental health disorder, of these, 52.4 % were women. The global prevalence of mental disorders is estimated at 13 %, the highest point prevalence was reported in the Americas (15.6 %).[4,5] Anxiety and depression are identified as the main problems in both sexes.

In El Salvador, mental health care faces significant challenges due to a long-standing shortage of resources and specialized services. According to the 2020 Mental Health Atlas, there are 369 mental health professionals in the country, which corresponds to a ratio of 5.72 professionals per 100 000 inhabitants.[6] Among them, psychologists account for 63.4 % of the professionals (n = 234), while psychiatrists (n = 87) represent a ratio of 1.35 per 100 000 inhabitants, and there are only three psychiatrists who treat children or adolescents. This shortage of specialized human resources severely limits the health system's capacity to adequately address the growing needs of the population.

Neuropsychiatric disorders, substance use disorders, and suicide account for 17 % of DALYs and 32 % of all Years Lived with Disability (YLDs) in the country.[7] Local studies indicate that 20.8 % to 23.1 % of the Salvadoran population experiences severe levels of anxiety, depression, or stress.[8] However, the lack of standardized data at the national level makes it difficult to ascertain the magnitude of this problem across life stages.

In response to this need, the National Mental Health Survey (NMHS) project was conceived and pioneered by the National Institute of Health of El Salvador (INS). To implement it, an interdisciplinary team was formed, comprising specialists in research, epidemiology, public health, statistics, information technology, and planning, in addition to support from INS administrative staff.

Within this framework, NMHS aimed to describe the mental health situation among children, adolescents, and adults, including mental disorders, psychosocial problems, and gaps in access to services. The objective of this manuscript is to describe the process of conceptualization, methodological design, and operational implementation of the first NMHS in El Salvador, and to present key performance indicators from the fieldwork; in particular, coverage and response rates disaggregated by geographic stratum in order to contextualize the findings and identify potential participation biases.

The results present implementation indicators, particularly the response rate and the distribution of participation by sex, age group, and geographic area; these findings are reported and discussed while considering the potential for non-response biases in the interpretation of the evidence generated by NMHS.

Results

Operational aspects of implementation

The NMHS was conducted using an observational, descriptive, and cross-sectional design with structured questionnaires administered in households. National representativeness was ensured through a multistage probability cluster sampling design, defined to allow for inferences at the national level and by domains of analysis (urban-rural areas and health regions: Western, Central, Metropolitan, Paracentral, and Eastern), incorporating design weights and adjustments for nonresponse.

The NMHS considered two units of analysis: households and the population divided into specific age groups: three to seven years, eight to 12 years, 13 to 17 years, adults aged 18 to 59 years, and adults aged 60 years and older. The categorization was based on the epidemiological analysis of mental health care services recorded in the Web-Based Morbidity and Mortality System (SIMMOW) and on the cutoffs of various relevant psychological instruments.[9]

The instruments applied in the field included scales previously validated in Latin American contexts (Table 1), applying validated cutoff points and operational criteria for the identification and classification of indicators by age group; these were reviewed by national experts. The selection of indicators was based on the main reasons for mental health consultations recorded in the services of the National Integrated Health System in previous years, through a review of morbidity data recorded by mental health services between 2019 and 2020 in SIMMOW.[9]

The survey's implementation included a pilot test, instrument validation, and intensive training of technical staff over a three-week period.

In addition to the psychometric scales prioritized by age group (Table 1), NMHS

incorporated a structured questionnaire with domains of cross-sectional variables for the comprehensive characterization of the population and the interpretation of indicators: (i) sociodemographic and household characteristics; (ii) living conditions and social determinants; (iii) self-reported health history and comorbidities; (iv) exposure to violence, potentially traumatic events, and other psychosocial stressors; (v) functioning and disability, as well as psychosocial resources (e.g., social support and resilience); (vi) behaviors and use of alcohol, tobacco, and other substances; (vii) access, utilization, and continuity of mental health care, including perceived barriers; and (viii) age-specific modules (e.g., internet and video game use, and bullying). The reference periods were established according to the version of each instrument/indicator used.

The selection was conducted in stages, using census segments as the sampling frame; within each selected segment, households were identified and visited for the interview. The estimated sample consisted of 7400 households distributed proportionally across urban and rural areas. The sample size was defined to estimate the prevalence of the main mental health indicators with national representativeness and by domains of analysis (urban-rural area and health regions), considering the cluster sampling design and nonresponse adjustment. A total of 296 census segments were selected across 125 districts, excluding those recently used in the Multipurpose Household Survey (MHS).[10] The final unit of analysis was the individual within the household, selected using the Kish Table.[11]

Table 1. Prioritized conditions, scales/instruments, and reference period, by age group

Age group	Prioritized conditions	Escalas o Instrumentos utilizados
Three to seven years	Attention deficit Hyperactivity Adjustment disorder Oppositional defiant disorder Conduct Disorder Behavioral disorder Post-traumatic stress	Abilities and Difficulties Questionnaire (ADQ) Post-traumatic stress disorder (CATS-C) Responses to Stress Questionnaire (RSQ)–(COVID-19) Questionnaire on access, use of the internet and video games (Ad hoc) Questionnaire on the use of and addiction to social networks and information (Ad hoc) Questionnaire on school bullying and cyberbullying (Ad hoc)
Eight to 12 years	Anxiety Depression Adjustment disorder Conduct Disorder Post-traumatic stress Bullying Video game addiction	Abilities and Difficulties Questionnaire (ADQ) Post-traumatic stress disorder (CATS-C) Responses to Stress Questionnaire (RSQ)–(COVID-19) Questionnaire on access, use of the internet and video games (Ad hoc) Questionnaire on the use of and addiction to social networks and information (Ad hoc) Questionnaire on school bullying and cyberbullying (Ad hoc)
13 to 17 years	Anxiety Depression Alcohol abuse and consumption Abuse and consumption of psychoactive substances Risk of suicide Post-traumatic stress Bullying Video game addiction	Abilities and Difficulties Questionnaire (ADQ) Assessment of anxiety and depression symptoms in children and adolescents (RCADS-47) Family environment and perceived support (Ad hoc) Suicide Risk Assessment (SRA) Intrafamily relations scale (ERI) Responses to Stress Questionnaire (RSQ)–(COVID-19) Questionnaire on access, use of the internet and video games (Ad hoc) Social Media and Internet Addiction Risk Scale (ERA-RSI) Questionnaire on school bullying and cyberbullying (Ad hoc) Game Addiction Scale for Adolescents (GASA)
18 to 59 years	Anxiety Depression Abuse and consumption of psychoactive substances Alcohol abuse and consumption Tobacco dependence Risk of suicide	Generalized Anxiety Scale (GAD-7) World Health Organization Disability Assessment Questionnaire (WHODAS) Alcohol, Smoking, and Substance Use Screening Test (ASSIST) Columbia Suicide Severity Rating Scale (C-SSRS) Post-Traumatic Stress Disorder in Adults (PCL-5) Brief resilience scale (BRS) Perceived Support Scale (PSS) Patient Health Questionnaire (PHQ-9)
60 years or older	Anxiety Depression Major neurocognitive disorder Alcohol abuse and consumption Abuse and consumption of psychoactive substances Risk of suicide	Pfeiffer Questionnaire Patient Health Questionnaire (PHQ-9) Generalized Anxiety Scale (GAD-7) World Health Organization Disability Assessment Questionnaire (WHODAS) Alcohol, tobacco and substance use (AUDIT) C-SSRS Suicide Risk Scale Perceived Social Support Questionnaire (CASPE) Perceived Stress Scale (PSS-10) Post-Traumatic Stress Disorder in Adults (PCL-5) Brief resilience scale (BRS) Scale of Perceived Support (SPS)

Fieldwork was carried out by a multidisciplinary team that included a thematic-methodological coordinator, an NMHS coordinator, technical staff (methodologist, psychologist, programmer), field staff (quality control officer, field manager, local coordinator, supervisors, interviewers, and drivers), and administrative staff (Figure 1), who, in coordination with the five health regions, community organizations, and municipal governments, carried out the mapping and data collection.

Data collection took place between August and November 2022. For the 3-7 and eight to 12 age groups, the questionnaire was administered to the parent or guardian responsible for the child's care, for those aged 13 and older, and the questions were asked directly to the selected individuals. The interviews were conducted in person (face-to-face) in the selected households using structured questionnaires; they were initially administered on paper and later migrated to a digital format using KoBoToolbox,[12] and statistical analysis was performed using IBM SPSS twenty-four.

Coverage and participation indicators: Response rate

Table 2 presents the total number of households sampled, those interviewed, and the response rate at the national level, by urban-rural area and health regions. Sampled households correspond to those expected based on the updated map; the interviewed households correspond to those that ultimately completed the NMHS questionnaires; and the Response rate (RR) is calculated as the percentage of interviewed households relative to the sampled households. Estimates of the number of households at the national level by geographic area and health regions are also included.

At the national level, the response rate was 82.9 %, with a total of 6837 households interviewed. Response rates were higher in rural areas (88.3 %) and in the eastern (92.6 %), western (85.9 %), and paracentral (84.2 %) regions. Urban-rural differences in the response rate should be considered when interpreting the effective representativeness of certain strata; therefore, results are presented by area and region as operational indicators of participation.

Response rate by age group and distribution by geographic area

Table 3 details the number of individuals planned for the sample based on the updated cartograph, the total number of individuals interviewed, the distribution of interviewees by sex, along with the response rate for each age group, urban-rural area, and health region. Nationally, the 8- to 12-year-old group had the highest response rate (83.7 %), while adolescents and older adults had the lowest response rates (63.5 % and 64.0 %, respectively). Across all age groups, the response rate was highest among participants from rural areas and varied significantly by health region.

Participation by sex, according to age group

Regarding the sex distribution of the interviewed sample (Table 4), a similar distribution was found in the groups of children aged three to seven and the eight to 12-year group, with similar participation rates among males and females, with a slightly proportion of male children: 51.5 % in the three to seven year group and 51.0 % in the eght to12-year group.

In the case of adolescents aged 13 to 17, a higher proportion of females (52.7 %) is observed compared to males (47.3 %). However, in the group of adults aged 18 to 59, there is a difference in the distribution by sex: 71.9 % of the sample are women, while only 28.1 % are men. In the group of adults aged 60 and older, a similar trend persists, with a majority of women (64.7 %) compared to men (35.3 %).

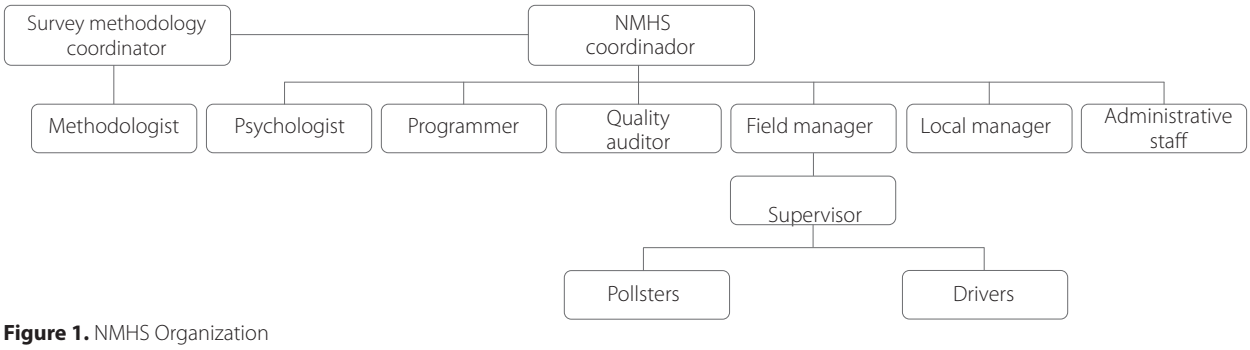

Figure 1. NMHS Organization

Discussion

In recent years, interest in mental health resarch at the population level has gained greater relevance due to the impact of global events such as the COVID-19 pandemic,[4,13] which have highlighted the global burden of mental health disorders. In 2021, the "State of the World's Mental Health report" collected data from 223 087 individuals across 34 countries, revealing an increase in mental health disorders, such as anxiety, among the population, particularly among young people.[13]

In this context, several countries[14,15] including El Salvador, identified the need to generate up-to-date and representative data to assess the mental health status of their populations. Consequently, national surveys have become a key tool for collecting this population data, enabling the formulation and targeting of strategies and interventions. For example, in the United States, data from the National Survey on Mental Health Perceptions (2024)[15] influenced the expansion of mental health programs in schools and communities;[16] while in Mexico, findings from the National Health and Nutrition Survey (2022) drove the implementation of a National Strategy for the Prevention of Addictions,[17] policies that strengthen the health systems' response to the population's mental health crisis.

In El Salvador, NMHS represents a milestone in mental health data collection, as it serves as the baseline for national indicators; from its planning (2019) through data collection (2022), it was a continuous process. The results were officially presented in March 2023[18] and since then, the NMHS has been widely disseminated in academic and scientific circles, as well as among decision-makers and legislators[19], establishing itself as a reliable source for informing mental health initiatives and guiding public policy.

Currently, NMHS findings are a key input in the formulation of strategies and the allocation of resources, strengthening the country's capacity to respond to mental health challenges based on evidence.

The NMHS revealed consistent variations in participation by geographic area, health region, and age group. Geographically, response rates were higher in rural areas than in urban areas, and differences were identified between regions, with lower relative participation in metropolitan areas. By age group, participation was comparatively lower among adolescents and older adults, while children's groups had a higher completion rate for interviews.

Table 2. Total households sampled, interviewed and response rate at the national level, urban-rural area and health regions

		Home			
Stratum		Sampled	Interviewees	Expanded	RR* (%)
	National	8245	6837	1 983 665	82.9 %
Area	Urban	3912	3012	947 720	77.0 %
	Rural	4333	3825	1 035 945	88.3 %
Health Region	Western	1700	1461	441 854	85.9 %
	Central	1582	1288	311 789	81.4 %
	Metropolitan	1776	1270	542 486	71.5 %
	Paracentral	1580	1330	299 766	84.2 %
	Eastern	1607	1488	387 770	92.6 %

*RR: Response rate

Table 3. Total population sampled. interviewed and response rate at the national level. urban-rural area and health regions

		Children 3-7 years			Children 8-12 years			Adolescents 13-17 years			Adults 18-59 years			Adults 60 years and over		
		Sampled	Interviewees	RR* (%)	Sampled	Interviewees	RR* (%)	Sampled	Interviewees	RR* (%)	Sampled	Interviewees	RR* (%)	Sampled	Interviewees	RR* (%)
	National	1822	1510	82.9 %	1904	1594	83.7 %	1896	1204	63.5 %	7097	5265	74.2 %	3074	1966	64.0 %
Área	Urban	713	540	75.7 %	785	601	76.6 %	821	463	56.4 %	3362	2201	65.5 %	1707	1023	59.9 %
	Rural	1109	970	87.5 %	1119	993	88.7 %	1075	741	68.9 %	3735	3064	82.0 %	1367	943	69.0 %
Región de Salud	Western	407	343	84.3 %	450	374	83.1 %	434	300	69.1 %	1530	1187	77.6 %	588	377	64.1 %
	Central	328	265	80.8 %	321	263	81.9 %	347	225	64.8 %	1340	966	72.1 %	619	396	64.0 %
	Metropolitan	318	226	71.1 %	361	256	70.9 %	370	152	41.1 %	1509	884	58.6 %	696	390	56.0 %
	Paracentral	355	296	83.4 %	370	322	87.0 %	393	243	61.8 %	1363	1038	76.2 %	574	377	65.7 %
	Eastern	414	380	91.8 %	402	379	94.3 %	352	284	80.7 %	1355	1190	87.8 %	597	426	71.4 %

*RR: Response rate

Table 4.. Percentage distribution by sex across the age groups included in NMHS

Sex	Children 3-7 years		Children 8-12 years		Adolescents 13-17 years		Adults 18-59 years		Adults 60 years and older	
	n=1510		n=1594		n=1204		n=5265		n=1966	
Male	777	51.5 %	813	51.0 %	570	47.3 %	1480	28.1 %	694	35.3 %
Female	733	48.5 %	781	49.0 %	634	52.7 %	3785	71.9 %	1272	64.7 %

These patterns constitute relevant operational findings of the process and should be considered in the interpretation of effective representativeness by strata, as well as in the design of strategies to reduce differential nonresponse in future applications.

The differences observed among these strata suggest the possibility of differential nonresponse, with a potential impact on the effective representativeness of certain domains of analysis. In population surveys, nonresponse may be associated with factors such as time constraints, mobility, safety conditions, distrust in institutions, or stigma,[20–22] and tends to be concentrated in specific groups. These factors are reflected in participation patterns by sex and age group; this higher participation rate among women could be influenced by sociocultural factors[20] and stigma[20–22] that limit men's willingness to participate in mental health studies.[20]

Likewise, structural barriers such as transportation difficulties,[20] lack of incentives,[20] loss of income due to time off work,[21] distrust in institutions,[21,23] and limited access to information[23] may influence the decision to participate and, consequently, the survey response rate. Therefore, systematically documenting the reasons for nonresponse (e.g., no contact, refusal, or absence) and their distribution by strata is essential for properly interpreting the results and guiding operational and statistical adjustments in future surveys.

These considerations highlight the importance of incorporating new strategies aimed at improving participation among groups with lower response rates, such as men, adolescents, and older adults. Among adolescents, self-administered methods via digital platforms[20] or the use of explanatory videos[24] have been described as effective tools for increasing youth participation, as they provide greater privacy and reduce the social anxiety associated with disclosing personal information. Among older adults, the integration of community networks and the involvement of caregivers facilitate data collection by reducing logistical barriers and fostering environments of trust.[21,25]

Based on these operational findings, future national mental health surveys should reinforce strategies to reduce differential nonresponse, including: (i) visits during extended hours and on weekends with planned follow-up visits, especially in urban areas; (ii) prior community coordination and on-site support to facilitate access and build trust; (iii) differentiated approaches for adolescents and older adults, with contact/recontact protocols and logistical adjustments tailored to each group; and (iv) strengthening training for field staff in communication, confidentiality, consent/assent, and stigma management. It is recommended that the weighting and calibration procedures be transparently described to account for the impact of nonresponse on domain-specific inferences.

In terms of utility for health management, NMHS constitutes a national baseline that strengthens the analysis and planning capacity of the National Integrated Health System by providing standardized evidence for program prioritization, the targeting of interventions, and the monitoring of gaps in access to mental health services throughout the life cycle. Likewise, its implementation provides an operational framework for inter-institutional coordination and the generation of information products with potential for use by health authorities, academia, and decision-makers.

Like any population-based survey, NMHS faces challenges inherent to measuring mental health in community settings, particularly those related to stigma and the willingness to report sensitive symptoms or experiences, which can influence the identification and reporting of certain events.[25]

In this regard, the interpretation of the results should consider both the conduct of the fieldwork and the quality assurance mechanisms and procedures implemented to mitigate nonresponse and maintain comparability across domains.

Finally, NMHS was made possible thanks to the strategic vision of INS leadership and the coordination of various National Integrated Health System institutions, together with support from academia and professional associations. This intersectoral effort strengthened national technical

capacities for the collection and analysis of mental health data and serves as a benchmark for the development of future public health innovation initiatives aimed at a more comprehensive, sustained, and evidence-based response.

NMHS ethical considerations and funding

The NMHS was conducted in accordance with the ethical principles established in the Declaration of Helsinki and international guidelines for health research involving human subjects. The research protocol was reviewed and approved by the National Ethics Committee for Health Research (Act No. 34/2022). Confidentiality of information was guaranteed, as was obtained verbal and written informed consent from participants or their legal guardians depending on the age group, and the exclusive use of data for statistical and public health purposes. Participation was voluntary, without financial compensation, and the right to withdraw at any time without consequences was respected.

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Conclusion

The National Mental Health Survey represents a significant advance for public health in El Salvador, offering robust information that can drive the implementation of more inclusive and effective strategies to address the specific needs of the Salvadoran population. The documented experience highlights the importance of integrating methodological planning, operational organization, quality control, and inter-institutional coordination to sustain national mental health measurement processes.

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