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ANXIETY DISORDERS IN CHILEAN ADOLESCENTS: A STUDY OF THEIR RELATIONSHIP WITH MULTIDIMENSIONAL POVERTY AT THE REGIONAL LEVEL

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Abstract: Introduction. Anxiety in adolescents is a common emotional response, but when it becomes chronic, it can have a significant impact on their well-being and development. Factors such as stress, social relationships and family pressures can trigger it, while poverty can aggravate it, creating an even more challenging environment that negatively affects their emotional development. **Objective.** To analyze the rate of low control of adolescents admitted for Anxiety disorders in the Mental Health Program in Primary Care in Chile during the period 2013 to 2022 and its relationship with Multidimensional Poverty at the regional level. **Materials and Method.** Ecological study in adolescent beneficiaries of FONASA (National Health Fund), who register being under control in the Mental Health program in the period 2013-2022 for diagnosis of Anxiety Disorders (AT). The rate of adolescents under control was estimated according to sex, region and year per 1000 beneficiaries and regional average multidimensional poverty. Percentage variation (PPV) between 2013 and 2022 and rate ratio (RR) were calculated to evaluate differences by sex. **Results.** During the study period, 7 out of every 1000 adolescents in the country are under control in the Mental Health Program due to AT, being 2.4 times higher in females than in males (RT = 2.376, 95%CI: [2.21-2.54]). All regions experienced an increase in the rate of AT, except Valparaíso. Araucanía had the highest percentage of population living in multidimensional poverty (24.9%), followed by Atacama (23.1%) and Tarapacá (22.5%), with no relationship with the AT rate ($p=0.206$). **Conclusion.** The results show a significant increase of adolescents under control for Anxiety Disorders, being 2.4 times higher in women and generalized at national level. No statistically significant relationship was found between multidimensional poverty and anxiety disorders, suggesting that other factors could be influencing their development.

Keywords: Mental health; Adolescents; Anxiety; Multidimension poverty; Adolescent mental health.

INTRODUCTION

Currently, the prevalence of mental disorders in the population continues to increase and has become a public health problem. Among mental disorders anxiety disorders are considered the most frequent in people of any age (ESSAU et al., 2018; SHAH & HAN., 2015), its prevalence fluctuates between 4-24% (CARBALLO et al., 2019). Anxiety is conceptualized as a physiological and behavioral response mechanism generated to avoid harm (MACÍAS-CARBALLO et al., 2019). However, if it becomes an uncontrollable and persistent response, it can become a pathology that undermines the quality of life of the individual. CHACÓN DELGADO et al. (2021), state that when the experience is perceived as a threat and the response is not very adaptive, it is considered as an anxiety disorder, characterized by fear and excessive worries throughout life, which arise in situations that do not represent a real danger for the person.

Anxiety Disorders (AT) in adolescents have become a topic of growing concern. This critical period of development is characterized by physical, emotional and social changes that may provide a favorable environment for the emergence of different types of anxiety (DÍAZ SANTOS-SANTOS VALLÍN., 2018; BUI et al., 2020). The prevalence of anxiety disorders among adolescents is alarming, in developed countries such as United States two, prevalence reaches 18% (LORA et al., 2021). It is estimated that approximately one in five adolescents experience some type of anxiety disorder that may include generalized anxiety disorder, specific phobias, social anxiety disorder, and panic disorder, among others (CROCKETT & MARTMEZ., 2023; AUERBACH et al., 2018; VICENTE et al., 2016).

There are several factors that can trigger anxiety situations in adolescents and contribute to the development of this problem, these are social pressure, bullying, academic expectations and the use of social networks among others (BAÑOS-CHAPARRO et al., 2023; MORALES-MUÑOZ et al., 2022; DÖRING S et al., 2019). Another important factor to mention is the increase in anxious and depressive disorders occurred in the population as consequence of the health crisis caused by COVID-19. The pandemic impacted the mental health of the general population, with presentation of anxiety, panic, depression, fear and stress mainly in adolescents (MINOZZI et al., 2021; WANG & ZHAO, 2020). It should be mentioned that this impact on the mental health of the population has been uneven, affecting women and children and adolescents more (OCHOA-FUENTES et al., 2022).

The influence of social factors in the development of mental health problems in the population is also identified, pointing to a connection between poverty, inequality and limited access to basic resources (ROMERO HENRÍQUEZ., 2024). Research in recent decades has shown that the relationship between socioeconomic inequality and mental illness has not disappeared, although there is contradictory evidence on the role of poverty, occupation, education and other social conditions in mental health (O'CONNOR AND O'NEILL., 2015; BUNTING et al., 2022).

Income poverty and marginalization may constitute risk factors for the development of anxiety disorders (EXPÓSITO-DUQUE et al., 2024). A disadvantaged socioeconomic position, rurality, lack of access to mental health services could increase the likelihood of developing anxiety disorders in the population (;GIL-DÍAZ et al., 2022; QUIÑONEZ et al., 2015). Although most research relates income poverty with the mental health of the population (BARRANTES., 2020), there are few

studies that analyze poverty from a multidimensional approach, understood as obtaining a more comprehensive diagnosis of poverty and which complements the income-based measure. This measurement is carried out in Chile by the Ministry of Social Development and Family through the National Socioeconomic Characterization Survey (CASEN 2022).

In this sense, the objective of this study is to analyze the rate of under control of adolescents admitted for Anxiety disorders in the Mental Health Program in Primary and Specialty Care in Chile during the period 2013 to 2022 and its relationship with Multidimensional Poverty at the regional level.

MATERIAL AND METHOD

An ecological study was conducted based on data provided by the Monthly Statistical Summaries (REM) of the Department of Statistics and Information of the Ministry of Health. The study population corresponds to adolescents, males and females aged 10-19 years old, beneficiaries of the National Health Fund (FONASA) of Chile, who registered being under control in the Mental Health program in Primary Health Care (PHC) and specialty with diagnosis of "Anxiety Disorders" in the period 2013-2022.

The sources of information used for this study were the P-6 Series of the Monthly Statistical Summaries (REM), which contains aggregate statistics on the population under control, specifically the Mental Health Program in Primary and Specialty Care; the databases of the population benefiting from the National Health Fund (FONASA) and the incidence of multidimensional poverty provided by the National Socioeconomic Characterization Survey (CASEN) conducted by the Ministry of Social Development and Family.

The P-6 series registry corresponds to people who were under control in the Primary and Specialty Care Mental Health Program

with a physician or psychologist (occupational therapist, social worker, nurse or other trained professional), due to risk factors and mental health conditions and/or diagnoses of mental disorders. This includes face-to-face services, telephone follow-up and/or remote controls. The population under control is considered to be all persons who have an appointment with these professionals, up to a maximum of 45 days of non-attendance at the cut-off date, which is in June and December of each year. Data are uploaded to the REM during the months of July and January.

The variables of diagnoses of “Anxiety Disorders”, “sex” (male-female), “region of the country” (the 16 regions of Chile are included), “multidimensional poverty” and “year of study” (2013 to 2022) were studied. “Anxiety Disorders” registered in APS and specialty include post traumatic stress disorders, panic disorder with agoraphobia, panic disorder without agoraphobia, social phobias, generalized anxiety disorders, other anxiety disorders that were measured.

The measurement of “multidimensional poverty” in the population delivered by CAsEN as of 2015, and considers five dimensions which are: Education, Health, Labor and Social Security, Housing and Environment, Networks and Social Cohesion. Each dimension has a weight of 22.5% except for Networks and Social Cohesion which is 10%. A household is considered to be in a situation of multidimensional poverty if it has 22.5% or more deprivations, which is equivalent to a traditional dimension (CAsEN, 2022). Before 2015, poverty measurement considered four dimensions, Education, Health, Work and Social Security, and Housing, and each of them was considered equally important, i.e., with the same relative weight.

In the statistical analysis, to describe trends, the rate of the population aged 10 and 19 years under control in the Mental Health

Program with a diagnosis of “Anxiety Disorders” was estimated by sex and by region, per 1000 FONASA beneficiaries in Chile, for each year of study. In addition, the Annual Percentage Variation (APV) between the years 2013 and 2022 of the estimated rates and the Rate Ratio (RT) were calculated to evaluate differences by sex with their respective 95% confidence intervals.

The measurement of multidimensional poverty for each region considered the average of the figures recorded in the years 2015, 2017 and 2022, with the exception of the Ñuble region which only considers the years 2017 and 2022. This average value of multidimensional poverty was related to the average rate of the population under control for “Anxiety Disorders” for the population aged 10 to 19 years by region. To evaluate the statistical significance of the differences, the Chi2 test was applied considering a $p\text{-value} < 0.05$.

The analysis of this study involves a source of information that uses anonymous data for public use. The records do not include any variable that would allow identification of the cases and therefore do not require authorization by the Scientific Ethics Committee (CEC).

RESULTS

Adolescents with diagnoses of Anxiety Disorders represent about one third of the total number of the population under control in the Mental Health Program in Primary Health Care (PHC) and specialty in the country. Records show that approximately 13,053 FONASA beneficiaries aged 10 to 19 years old were under control for diagnoses of Anxiety Disorders in 2013, a figure that increases to 25,432 in 2022

Figure 1 shows the trend in the rate of the population aged 10 to 19 years under control for “Anxiety Disorders” at the country level and disaggregated by sex for the study period. Between the years 2013 to 2019, similar values

are observed, with a significant decrease in 2020 and a significant increase from that year to 2022. The annual percentage change (APV) of the rate between 2013 and 2022 was 76.5%, being 59.6% in men and 76.2% in women.

In the study period, 7 out of every 1000 FONASA beneficiaries aged 10-19 years are under control in the country for "Anxiety Disorders" in the Mental Health Program, with the rate being 2.4 times higher in women than in men $RT = 2.376$, 95%CI: [2.21- 2.54]).

Table 1 shows the results of the rate of under control for Anxiety Disorders in the population aged 10 to 19 years in the Mental Health program in the regions of Chile for the period 2013 - 2022. In general, it is observed that all regions experienced a positive increase in the rate of Anxiety Disorders for the study period, with the exception of the Valparaíso region which shows a decrease of - 2.0% as VPA.

The region of Arica and Parinacota stands out with a significant increase in the rate of under control for Anxiety Disorders (VPA=460.3%) between 2013 and 2022. A similar situation was observed in the regions of Atacama (VPA=316.9%), Maule (VPA=153.8%) and Los Lagos (VPA=109.7%). The year 2020 shows the lowest figures for the rate of under control for Anxiety Disorders for all regions.

Table 2 shows the average rate of Anxiety Disorders in beneficiaries aged 10 to 19 years under control in the Mental Health Program in Primary Health Care (PHC) and specialty in each region of Chile during the study period, disaggregated by sex. The Aysén region (13.73 x 1000) shows, on average, the highest rate of Anxiety Disorders for the period, followed by the Ñuble region (11.31 x 1000) and the Arica y Parinacota region (10.84 x 1000).

According to sex, the average rate of anxiety disorders was higher in women compared to men in all regions of Chile. The region of Aysén stands out, where 20 out of every 1000

female beneficiaries between 10 and 19 years of age are under control in the Mental Health Program in that region.

In the region of Arica and Parinacota, the average for this diagnosis was 2.69 times higher in women compared to men, while in the region of Magallanes and Antarctica it was 1.84 times higher.

Figure 2 shows the average "multidimensional poverty" in the population for each region of Chile together with the rate of Anxiety Disorders in beneficiaries aged 10 to 19 years under control in the Mental Health Program.

It shows that Araucanía is the region with the highest percentage of people with multidimensional poverty (24.9%) along with the Atacama region (23.1%) and Tarapacá (22.5%). However, the highest average rate of Anxiety Disorders was observed in the region of Aysén with 13.7 x 1000 beneficiaries aged 10 to 19 years, followed by Ñuble (11.3 x 1000) and Arica y Parinacota (10.8 x 1000). No relationship was observed between the Multidimensional Poverty status of the region and the rate of beneficiaries under control for Anxiety Disorders ($p=0.206$).

DISCUSSION

The present study described the rate of under control of adolescents admitted for anxiety disorders to the Mental Health Program in Primary and Specialty Care in Chile between 2013 and 2022, and its relationship with Multidimensional Poverty at the regional level. The findings reveal a worrying increase in the rate of under control for Anxiety Disorders in the adolescent population in Chile, between 2013 and 2022. This situation is manifested in all regions with the exception of Valparaíso, which shows a slight decrease. In relation to multidimensional poverty at regional level, there is no concordance with the low control of adolescents admitted for Anxiety Disorders in Primary and Specialty Care for the study period.

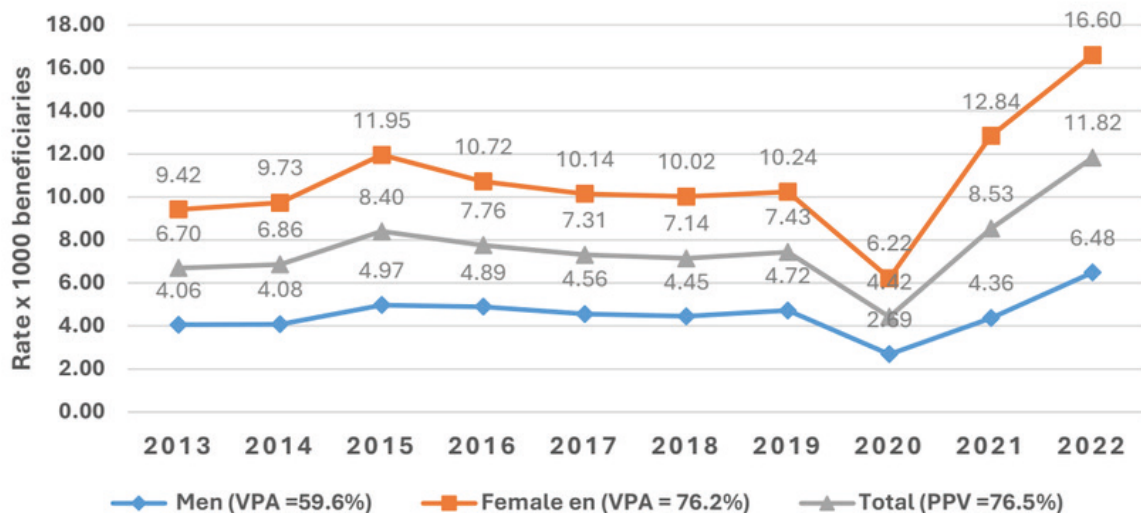


Fig.1. Trend of the population aged 10 to 19 years under control for Anxiety Disorders in the Mental Health Program in Primary Health Care (PHC) and specialty in Chile, years 2013 to 2022.

Regions of Chile	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	VPA*
Tarapacá	4,42	9,03	8,90	8,18	7,15	6,53	5,36	2,65	4,08	5,83	31,9
Antofagasta	7,50	5,87	6,08	4,54	3,80	3,53	3,79	2,45	5,66	7,72	2,9
Atacama	4,49	5,01	5,36	6,34	6,69	4,90	7,91	3,73	10,02	18,72	316,9
Coquimbo	6,27	6,68	10,41	8,64	7,70	8,26	8,57	4,99	9,37	12,00	91,4
Valparaiso	7,04	7,01	9,94	8,96	7,63	8,76	7,72	4,56	8,72	6,90	-2,0
O'Higgins	5,96	6,81	7,24	6,42	4,86	4,83	4,56	3,25	6,88	9,17	53,9
Maule	3,72	4,09	6,44	5,00	5,22	5,36	5,90	3,95	7,82	9,44	153,8
Bio Bio	7,08	7,06	7,01	6,38	6,33	5,04	8,31	5,73	10,33	14,85	109,7
Araucania	6,05	6,44	7,79	6,65	7,37	7,35	6,62	3,88	7,49	11,18	84,8
The Lakes	5,64	6,58	8,01	7,70	7,35	6,98	6,94	4,72	8,88	14,14	150,7
Aysén	12,27	13,35	13,93	16,65	10,90	12,69	16,73	6,97	13,25	20,93	70,6
Magallanes and Antarctica	6,49	5,12	4,78	5,65	3,53	3,97	9,27	5,88	10,40	10,37	59,8
Metropolitan	7,06	6,73	8,56	8,39	7,99	7,98	7,94	4,31	8,38	13,69	93,9
Los Rios	5,10	4,55	4,55	4,95	5,85	7,15	3,76	2,98	4,71	10,32	102,4
Arica and Parinacota	3,83	8,43	9,78	8,15	8,01	9,38	11,07	8,04	17,63	21,46	460,3
Ñuble	0	0	0	0	0	0	11,06	6,31	11,24	16,58	49,9

Table 1. Rate of diagnoses of Anxiety Disorders in beneficiaries aged 10 to 19 years under control in the Mental Health Program in Primary Health Care (PHC) and specialty in the regions of Chile per 1000 beneficiaries, 2013 to 2022.

*(VPA = Annual Percentage Change between 2013-2022)

Regions of Chile	Rate in Men (x1000)	Rate in Women (x 1000)	Rate Region (x 1000)	*RT (CI:95%)
Tarapacá	3,79	8,50	6,10	2,28 (1,847:2,787)
Antofagasta	3,12	7,13	5,10	2,30 (1,732:3,328)
Atacama	4,10	10,91	7,43	2,53 (1,872:3,483)
Coquimbo	4,92	11,84	8,32	2,40 (1,936:3,389)
Valparaíso	4,80	10,18	7,64	2,27(1,127:2,800)
O'Higgins	3,50	8,61	6,01	2,41 (1,940:3,254)
Maule	3,16	8,40	5,73	2,60(2,140:3,457)
Bio Bio	4,44	10,53	7,39	2,34(2,086:2,694)
Araucanía	3,98	10,32	7,10	2.56(2,326:3,045)
The Lakes	4,23	11,31	7,71	2.64(2,096:3,536)
Aysén	7,73	20,10	13,72	2.74(1,632:3,987)
Magallanes and Antarctica	4,56	8,41	6,41	1.83(1,253:3,4329)
Metropolitan	4,85	11,71	8,23	2.37(2,062:2,966)
Los Ríos	3,11	7,58	5,34	2.44(1,424:4,558)
Arica and Parinacota	5,90	15,88	10,84	2.84(2,230:4,020)
Ñuble	6,41	16,39	11,31	2.51(2,130:2,831)

Average rate of Anxiety Disorders in beneficiaries aged 10 to 19 years under control in the Mental Health Program in Primary Health Care (PHC) and specialty in the regions of Chile per 1000 beneficiaries, 2013 to 2022.

*(RT = Rate Ratio Women / Men)

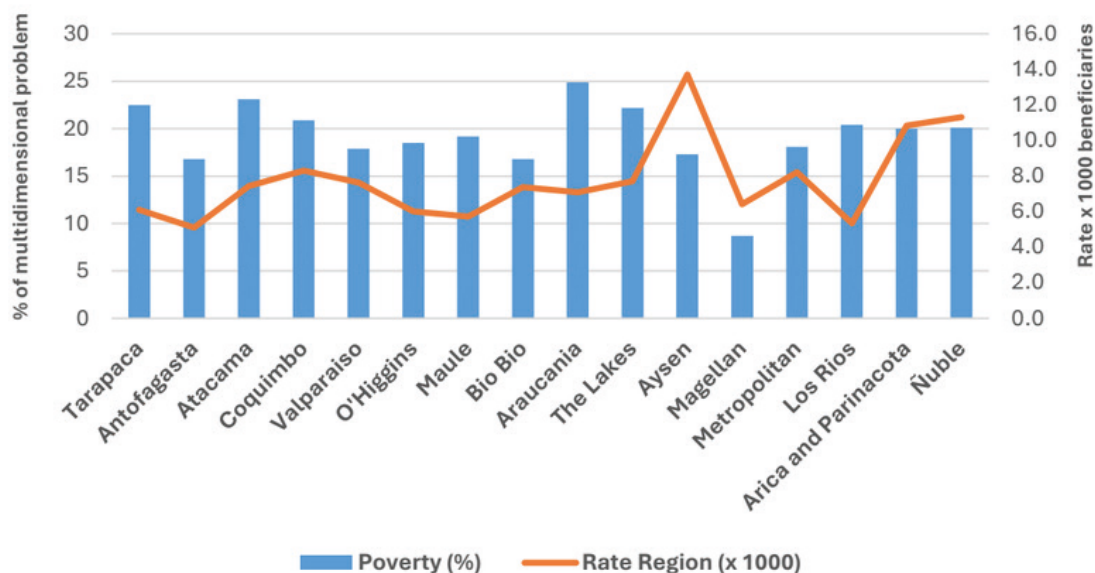


Fig.2. Average percentage of multidimensional poverty and average rate of Anxiety Disorders in beneficiaries aged 10-19 years under control in the Mental Health Program in Primary Health Care (PHC) and specialty in the regions of Chile, period 2013-2022. (Rate x 1000 beneficiaries)

Anxiety disorders are the most frequent psychiatric disorders presenting early in life, especially in adolescence, with prevalence rates ranging from 10% to 20% (CUENCA-ROBLES et al., 2020; LORA et al., 2021; GÓMEZ-RESTREPO et al 2021; PASCUAL et al., 2022). This evidence is consistent with the results of this study, where 11 out of every 1000 adolescents are under control by diagnosis of Anxiety Disorders in Primary Health Care and specialty in the country, during the year 2022. Research has shown that if not adequately treated, they often persist into adulthood (BUNTING et al., 2022; SBICIGO et al., 2020). Although a decrease in the rate of adolescent under control was observed during 2020, this is only a reflection of the situation that occurred due to the COVID-19 pandemic and the implemented measures of confinement and social distancing worldwide (OCHOA-FUENTES et al., 2022). The COVID-19 pandemic is associated with an increase in anxious, depressive and post-traumatic symptoms in the child and adolescent population (PARICIO DEL CASTILLO and PANDO VELASCO, 2020).

Women tend to have higher rates of anxiety disorders compared to men (CROCKETT & MARTMEZ., 2023; AUERBACH et al., 2018; del RÍO LOZANO et al., 2020). The probability of being diagnosed with an anxiety disorder is twice as high in women (RUIZ-VILLA et al., 2023; MACÍAS-CARBALLO et al., 2019), being similar to the results obtained in this study, where the rate was 2.4 times higher in women than in men. The prevalence of mental disorders is not only related to masculinity or femininity, but also to the appearance and presentation of symptoms. According to ÁLVAREZ RÚA et al., (2019) and COVASOLAR, (2004), women are more likely than men to recognize their own emotional reactions, whereas men may underestimate their mental health problems because they have difficulty seeking help.

Multidimensional poverty, which encompasses the dimensions of education, work, social security, housing, social networks and access to health services, can limit the opportunities for adolescents to receive the necessary support when they present a health problem. In regions with high rates of poverty, families are more likely to face other barriers, such as lack of transportation to health centers, lack of adequate psychological care, and economic uncertainty, which exacerbates any health problems presented by the individual. The relationship between the rate of anxiety disorders and multidimensional poverty is not always direct and the reasons for this may be varied. Lack of knowledge or stigma towards mental health may cause anxiety disorders to go unreported in low-income populations, preventing adolescents from accessing medical care, or the population under control may be subject to the system's offer for such care, as would be the case in this study. Likewise, it is important to emphasize that stigma towards mental health is not the only barrier that limits access to mental health services, since not being sure of the effectiveness of treatment and in some cases, the costs of it significantly hinder access and adherence to treatment (PAZ-PÉREZ et al., 2022). There is also the interaction of other factors, such as genetics, family environment and personal resilience, which could complicate the relationship between multidimensional poverty and anxiety disorders (CERVANTES PEREA et al., 2019)

Anxiety disorders often coexist with other mental health problems, such as depression, being factors associated with suicidal ideations and behaviors in adolescents (CAÑÓN-BUITRAGO Y CARMONA-PARRA., 2018), so these results have important implications for public health policies in Chile. Early identification and treatment of anxiety disorder can help to potentially reduce, the risk of sui-

cide at this stage of the life cycle. Therefore, understanding anxiety disorders in this age group is essential to develop appropriate prevention and intervention strategies that promote healthy emotional well-being in young people (IRARRAZABAL et al., 2016)

Despite the relevance of this study, it is important to recognize its limitations. The observational and cross-sectional nature of the data may imply biases in the recording and interpretation of the relationship between anxiety disorders and multidimensional poverty at the regional level. Longitudinal studies

evaluating the impact of specific interventions for the management of anxiety disorders in adolescents from different socioeconomic contexts are suggested

In conclusion, the high rate of low control of anxiety disorders in adolescents in Chile and multidimensional poverty at the regional level underscore the need for a more holistic approach to mental health treatment. It is essential that policies that address both mental health and socioeconomic conditions are prioritized in order to provide adequate support to this vulnerable population.

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