

---

# Journal of Creativity Student

<http://journal.unnes.ac.id/journals/jcs>

---

## Trend of Increasing Prevalence of Obesity in Women of Reproductive Age in Indonesia: Analysis of IFLS Survey Data (1993-2014) by Age Group

Elvie Febriani Dungga<sup>1</sup><sup>\*</sup>, Widya Hary Cahyati<sup>2</sup>

<sup>1</sup>Universitas Negeri Semarang, <https://orcid.org/0000-0001-8225-0465>

<sup>2</sup>Universitas Negeri Semarang, <https://orcid.org/0000-0003-2277-6566>

\*Corresponding Author: [elvie.dungga@ung.ac.id](mailto:elvie.dungga@ung.ac.id)

---

### Abstract

The escalating prevalence of overweight among women of reproductive age in Indonesia has emerged as a critical public health challenge. This study aims to analyze temporal trends in overweight prevalence among Indonesian women aged 15–49 years and investigate age-specific risk patterns using nationally representative longitudinal data. Utilizing the Indonesia Family Life Survey (IFLS) across all five waves (1993–2014), we extracted anthropometric, demographic, and socioeconomic data from the USbook health examination module. A total of 53,348 observations were analyzed after excluding outliers, with overweight defined as BMI  $\geq 25$  kg/m<sup>2</sup>. Univariable logistic regression was employed to finding. The result demonstrated a marked increase in overweight prevalence from 18.8% (947/5,038) in 1993 to 38.3% (5,094/13,290) in 2014. While the highest prevalence initially clustered in women aged 35–39 years (1993–2007), a notable shift occurred in 2014, with the 30–34-year cohort surpassing other groups. Regression analysis revealed a significant age-gradient association, peaking at ages 40–44 (OR: 2.14, 95% CI: 1.89–2.43,  $p < 0.001$ ), suggesting heightened vulnerability in this demographic despite younger cohorts exhibiting faster prevalence growth. These findings underscore the dual burden of overweight among Indonesian women: an expanding younger population with rising incidence and persistently elevated risk in perimenopausal groups. The study advocates for life-course-targeted interventions prioritizing women aged 40–44 while addressing upstream determinants across reproductive-age populations. This longitudinal evidence provides critical insights for policymakers to design age-stratified strategies combating Indonesia's overweight epidemic.

**Keywords:** obesity, IFLS, reproductive women

---

### INTRODUCTION

The escalating prevalence of obesity among women of reproductive age in Indonesia has become a major public health issue, drawing attention in recent studies. This group is especially at risk for the negative health outcomes linked to obesity, such as reproductive health problems, diabetes, heart disease, and various psychosocial challenges. Obesity in women of reproductive age can affect their reproductive system, causing menstrual cycle disorders, decreased egg quality, and increasing the risk of complications during pregnancy, such as gestational diabetes, preeclampsia, and premature birth. Obesity can also increase the risk of metabolic diseases such as type 2 diabetes and hypertension, which are directly related to heart disease and other cardiovascular disorders.

The prevalence in Indonesia is upward, with noted effects particularly pronounced in women. Overweight and obesity rates in women range from 26% to 31% compared to 16% to 21% for men, showcasing a stark gender difference that is likely tied to lifestyle changes, including dietary habits and physical activity levels. The increasing trend is alarming, with the prevalence of obesity among women specifically defined as those with a body mass index (BMI) of 25 or higher, consistently rising over the last decade. Moreover, data from Indonesia Basic Health Research indicated that 51.3% of women aged 25 and older in certain regions of Indonesia are classified as having central obesity, reinforcing the notion that obesity disproportionately affects women.

Factors such as dietary changes, sedentary lifestyles, and genetic factors have contributed to the

increasing obesity rates among women of reproductive age. Age disparities also play a crucial role in understanding obesity trends among women of childbearing age. Younger women, particularly those aged 15-24 years, display significant rates of both obesity and chronic energy deficiency (CED), often attributed to inadequate dietary habits and limited physical activity. In contrast, older women tend to face health complications more directly linked to obesity, underscoring the necessity for targeted interventions that consider these age-specific dynamics. Furthermore, studies have noted that the societal acceptance of certain body types often results in delayed recognition of obesity as a health issue among younger women, necessitating enhanced public health education.

The importance of this study lies in its ability to dig deeper into obesity trends among Indonesian women of reproductive age by utilizing long-term data from Indonesia Family Life Survey (IFLS). Such research can provide more comprehensive insights into the factors that contribute to the increasing prevalence of obesity in Indonesia, whether individual, social, cultural, or economic. By understanding obesity trends by age group, it is hoped that more targeted health policies can be formulated, as well as effective obesity prevention and management strategies. To better understand this trend and its underlying causes, it is essential to conduct a comprehensive analysis that considers age groups, as well as current dietary and lifestyle habits. Therefore, this study aims to analyze obesity trends in women of childbearing age in Indonesia and the correlation between age groups and overweight

## **METHOD**

This study used secondary data of Indonesia Family Life Survey (IFLS). All waves (wave 1 to wave 5) were used which in 1993, 1997, 2000, 2007, and 2014. The IFLS provides comprehensive data on a range of socio-economic, health, and demographic factors, collected from a nationally representative sample of households in 13 of Indonesia's 34 provinces. These provinces include Aceh, North Sumatra, West Sumatra, South Sumatra, Jakarta, West Java, Central Java, East Java, Bali, Yogyakarta, Banten, South Sulawesi, and East Nusa Tenggara. These regions were selected to represent a range of socio-economic contexts, allowing for a comprehensive analysis of trends and disparities within the country. The IFLS is led by the RAND Corporation, in collaboration with several key stakeholders, including the Indonesian Ministry of Health, the Ministry of National Development Planning (BAPPENAS), and other national and local agencies involved in health and development research. The survey is funded by a variety of international donors, including the US National Institutes of Health (NIH) and the US Agency for International Development (USAID).

IFLS data are publicly available for research purposes, with access through the survey's official website. Researchers and policymakers can access the dataset after completing a registration process on the website, which provides detailed documentation and metadata for proper interpretation of the data. The data are valuable for conducting a variety of studies on health, education, employment, and policy interventions over time. For more information and to access the data, you can visit the IFLS official website at <https://www.rand.org/labor/health/ifls.html>.

This current study was used the Book US (health measurement), which contained the data of weight, height, age, and sex. The study sample only used women of reproductive age (15 to 49 years old) to be included in the analysis. The outliers were excluded from the analysis, consisted of weight less than 25 kg and higher than 200 kg and height less than 100 cm and higher than 200 m. The overweight status was calculated using the body mass index (BMI) formula. The formula is body weight in kg divided by body height in meter squares ( $\text{kg}/\text{m}^2$ ). The overweight cut off is following the BMI categories by Ministry of Health Indonesia which BMI 25.0 or higher was categorized as overweight. The total sample of each wave such as wave 1 (5,038), wave 2 (14,555), wave 3 (10,417), wave 4 (10,048), and wave 5 (13,290). The simple logistic regression was done to find the crude odd ratio. The data analysis was done using STATA software. The original survey was holding the ethical approval from University of Indonesia and University of Gajah Mada.

## **RESULT & DISCUSSION**

The results of this study offer the trend of women of reproductive age with overweight in general, by age group, and the correlation between age group and overweight in all waves. Table 1 below shows the proportion of women in reproductive age with overweight. It revealed increasing number of women with overweight from 1993 to 2014. In 1993, among 5,038 women, 947 of them were overweight. In 1997, among 14,555 women, 2,044 of them were overweight. In 2000, among 10,417 women of

reproductive age, 2,044 of them were overweight. In 2007, there was 2,891 overweight women from 10,048 women aged 15 to 49 years old. Surprisingly, in 2014, there was 5,094 overweight women in 13,290 total reproductive women who participated in the survey.

Table 1. The proportion of women of reproductive age with overweight in all IFLS waves

Year	Number of women with overweight		Total sample
	Yes	No	
1993	947	4,091	5,038
1997	2,044	12,511	14,555
2000	2,044	8,373	10,417
2007	2,891	7,157	10,048
2014	5,094	8,196	13,290

Table 2 below describes the five years age group of women of reproductive age and its percentage of being overweight. The data revealed that in 1993, the highest percentage of overweight women were in range age 35-39 years old which by 24.39%. In 1997, the most women aged 40-44 years old were overweight, by 21.82%. Similar to the data in 1993, in 2000 and 2007, the highest percentage of overweight women were in range age 35-39 years old which by 20.16% and 18.54%. In 2014, the highest percentage of overweight women turned to the younger age group which age 30-34 years old, by 21.32%.

Table 2. The percentage of women with overweight by age group in all IFLS waves

Year	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1993	1.48	5.07	14.36	22.91	24.39	20.38	11.40
1997	5.04	7.49	11.55	19.23	19.86	21.82	15.02
2000	5.87	9.05	11.94	18.35	20.16	19.28	15.36
2007	3.87	9.79	15.25	17.81	18.54	17.71	17.02
2014	4.28	9.05	15.49	21.32	19.61	16.45	13.80

Figure 1 below shows the percentage of each age group of reproductive aged women who were overweight. It revealed that the highest percentage of women with overweight was in 1993 aged 35 to 39 years old. Early reproductive aged 15 to 19 and 20 to 24 years old showed that percentage lower than 10. Additionally, the trend became higher starting from aged 25-29 years old with the percentage were up to 20% for all waves. The late reproductive age turned to be lower starting from aged 40-44 years old and does not look sharply decreased. The trend simplifies the risk of early older persons of being overweight, especially women of reproductive aged.

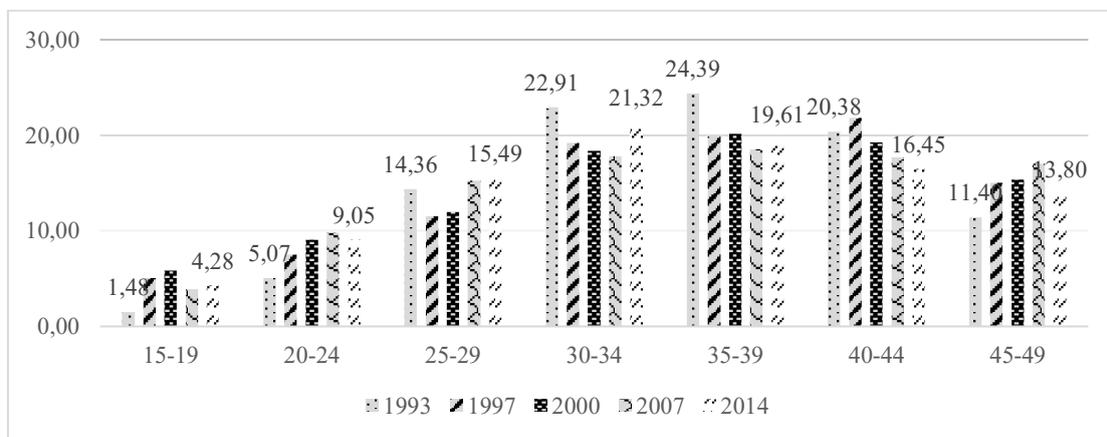


Figure 1. Age group comparison on women with overweight in all IFLS waves

The correlation between age group and odds of being overweight has showed in Table 3 below. It revealed that age group has significantly associated with overweight. In 1993, compared to women aged 15 to 19 years old, women aged 40 to 44 years old were 7.36 times more likely to be overweight. Similar to 1993, in 1997, 2000, 2007, and 2014, the highest crude odds ratio of being overweight was found among women aged 40 to 44 years old. The intervention might need to focus on this age groups.

Table 3. The crude odds ratio of correlation between age group and being overweight in all IFLS waves

Age group	1993				1997				2000				2007				2014			
	COR	p-value	[95% CI]		COR	p-value	[95% CI]		COR	p-value	[95% CI]		COR	p-value	[95% CI]		COR	p-value	[95% CI]	
15-19	ref				ref				ref				ref				ref			
20-24	1.85	0.049	1.00	3.40	2.34	0.000	1.81	3.02	1.84	0.000	1.45	2.33	2.39	0.000	1.90	3.01	2.47	0.000	2.07	2.94
25-29	3.78	0.000	2.15	6.67	3.90	0.000	3.07	4.95	3.00	0.000	2.39	3.78	3.86	0.000	3.10	4.81	4.38	0.000	3.71	5.17
30-34	5.58	0.000	3.20	9.73	6.41	0.000	5.12	8.03	5.69	0.000	4.57	7.08	6.65	0.000	5.33	8.29	5.93	0.000	5.05	6.98
35-39	7.05	0.000	4.04	12.30	7.28	0.000	5.82	9.11	7.23	0.000	5.82	8.99	8.30	0.000	6.65	10.36	7.48	0.000	6.34	8.83
40-44	7.36	0.000	4.20	12.89	10.37	0.000	8.29	12.97	8.92	0.000	7.15	11.12	9.27	0.000	7.41	11.61	8.96	0.000	7.54	10.65
45-49	6.32	0.000	3.55	11.26	8.50	0.000	6.73	10.74	8.45	0.000	6.72	10.62	9.25	0.000	7.38	11.59	8.91	0.000	7.46	10.65

A consistent trend related to the prevalence of obesity among women of reproductive age in Indonesia between 1993 and 2014. The number of overweight women increased significantly from 947 overweight women from 5,038 respondents in 1993, to 5,094 women from 13,290 respondents in 2014. This increase illustrates a striking change in the pattern of obesity prevalence among women of reproductive age in Indonesia, indicating that obesity is becoming a growing public health problem and requires serious attention. These results are consistent with global trends showing an increase in the prevalence of obesity in various age groups, especially in developing countries. The rise in obesity in developing countries like Indonesia can be attributed to a combination of factors, including dietary changes, a shift towards more sedentary lifestyles, and increased urbanization. The increasing availability and consumption of calorie-dense, nutrient-poor foods have contributed to the rise in obesity rates in both developed and developing countries. In Indonesia, the urbanization process has led to significant lifestyle changes, where women have shifted from traditional diets to more processed foods, and the opportunities for physical activity have diminished due to busier work schedules, increased reliance on transportation, and sedentary leisure activities like watching television or using digital devices.

Dietary patterns become pivotal in addressing obesity in this demographic context. A shift toward increased consumption of fast food and calorie-dense foods correlates strongly with rising obesity rates; research has established a clear association between fast food consumption and higher obesity rates among women in Bandung, Indonesia. Similarly, a study focused on dietary behaviours observed that low nutrition literacy hinders effective decision-making regarding food choices, contributing to unhealthy eating patterns among obese women. This dietary trend is exacerbated by sedentary lifestyles, which are increasingly common due to urbanization and economic shifts.

Analysis by age group also shows an interesting pattern. In 1993, women aged 35-39 years had the highest percentage of overweight, at 24.39%, which then decreased in older age groups. However, in 2014, the 30-34 age group showed the highest percentage at 21.32%. This phenomenon indicates that the problem of obesity does not only involve older women, but also younger women who may face a higher risk of being overweight over time. This trend is even more pronounced when we look at the data across age groups. Younger women are particularly vulnerable to the development of overweight and obesity due to factors such as changes in hormonal levels, sedentary lifestyles, and unhealthy dietary habits, which are often exacerbated by social and economic factors. Such as changes in eating patterns in modern times where nutrient-poor foods have become more widely available and affordable. As seen in Figure 1, young reproductive-age women (15–19 years and 20–24 years) have a lower prevalence of overweight, at less than 10%. However, this prevalence begins to increase in the 25–29 age group and reaches approximately 20% across all survey waves. These results suggest that obesity begins to become a more significant problem in young adulthood, when women may begin to have uncontrolled eating patterns or face challenges balancing work, family, and personal health.

## CONCLUSION

The study demonstrates a clear trend of increasing overweight prevalence among women of reproductive age in Indonesia from 1993 to 2014, with the proportion rising significantly over the years. The highest percentage of overweight women varied across age groups, with the 35-39 age group most affected in 1993, 2000, and 2007, while the 30-34 age group became the most affected in 2014. The odds of being overweight were significantly higher for women aged 40-44 years, with this age

group consistently showing the highest crude odds ratio across all survey waves. These findings highlight the growing concern of overweight in women of reproductive age and suggest that interventions should specifically target older women, particularly those in the 40-44 age group, to effectively address this public health issue.

#### ACKNOWLEDGMENTS

We would like to thank the RAND Corporation for providing the IFLS data and the Indonesian Ministry of Health, BAPPENAS, and other stakeholders for their support. Our appreciation also goes to the US NIH and USAID for funding the survey, and to the University of Indonesia and Gadjah Mada University for their ethical approval. Finally, we are grateful to all the survey participants for making this research possible.

#### DECLARATION OF CONFLICTING INTERESTS

The authors states that there is no conflict of interest in the publication of this article.

#### REFERENCES

- Anyanwu, Oyedolapo A, Sara C Folta, Fang Fang Zhang, Kenneth Chui, Virginia R Chomitz, Martha I Kartasurya, and Elena N Naumova. "A Cross-Sectional Assessment of Dietary Patterns and Their Relationship to Hypertension and Obesity in Indonesia." *Current Developments in Nutrition* 6, no. 6 (June 2022): nzaco91. <https://doi.org/10.1093/cdn/nzaco91>.
- Azam, Mahalul, Luluk Fadhoh Sakinah, Martha Irene Kartasurya, Arulita Ika Fibriana, Tania Tedjo Minuljo, and Syed Mohamed Aljunid. "Prevalence and Determinants of Obesity among Individuals with Diabetes in Indonesia." *F1000Research* 11 (2022): 1063. <https://doi.org/10.12688/f1000research.125549.3>.
- Colozza, David, and Mauricio Avendano. "Urbanisation, Dietary Change and Traditional Food Practices in Indonesia: A Longitudinal Analysis." *Social Science & Medicine* 233 (July 2019): 103–12. <https://doi.org/10.1016/j.socscimed.2019.06.007>.
- Coppi, Francesca, Valentina Bucciarelli, Kateryna Solodka, Valentina Selleri, Giada Zanini, Marcello Pinti, Milena Nasi, et al. "The Impact of Stress and Social Determinants on Diet in Cardiovascular Prevention in Young Women." *Nutrients* 16, no. 7 (April 3, 2024): 1044. <https://doi.org/10.3390/nu16071044>.
- Haththotuwa, Rohana N., Chandrika N. Wijeyaratne, and Upul Senarath. "Worldwide Epidemic of Obesity." In *Obesity and Obstetrics*, 3–8. Elsevier, 2020. <https://doi.org/10.1016/B978-0-12-817921-5.00001-1>.
- Karisa, Salma, and Agil Dhiemitra Aulia Dewi. "THE RELATIONSHIP BETWEEN FAST FOOD CONSUMPTION AND OBESITY IN WOMEN OF CHILDBEARING AGE IN BANDUNG." *Journal of Global Nutrition* 2, no. 1 (July 8, 2022): 132–38. <https://doi.org/10.53823/jgn.v2i1.29>.
- Lister, Natalie B., Louise A. Baur, Janine F. Felix, Andrew J. Hill, Claude Marcus, Thomas Reinehr, Carolyn Summerbell, and Martin Wabitsch. "Child and Adolescent Obesity." *Nature Reviews Disease Primers* 9, no. 1 (May 18, 2023): 24. <https://doi.org/10.1038/s41572-023-00435-4>.
- Megawati, Ginna, Noormarina Indraswari, Alexandra Aurelia Johansyah, Capella Kezia, Dewi Marhaeni Diah Herawati, Dida Achmad Gurnida, and Ida Musfiroh. "Comparison of Hs-CRP in Adult Obesity and Central Obesity in Indonesia Based on Omega-3 Fatty Acids Intake: Indonesian Family Life Survey 5 (IFLS 5) Study." *International Journal of Environmental Research and Public Health* 20, no. 18 (September 8, 2023): 6734. <https://doi.org/10.3390/ijerph20186734>.
- Natalia Latif, Benedicta, Ratu Ayu Dewi Sartika, and Fani Widiartha. "Hypercholesterolemia as a Dominant Factor of Central Obesity among Adult Patients at Bojong Gede Public Health Center, Bogor Regency, Indonesia." *Mediterranean Journal of Nutrition and Metabolism* 14, no. 1 (March 3, 2021): 69–77. <https://doi.org/10.3233/MNM-200499>.
- Nurhasan, Mulia, Desy Leo Ariesta, Mia Mustika Hutria Utami, Mochamad Fahim, Nia Aprillyana, Agus Muhammad Maulana, and Amy Ickowitz. "Dietary Transitions in Indonesia: The Case of Urban, Rural, and Forested Areas." *Food Security* 16, no. 6 (December 22, 2024): 1313–31. <https://doi.org/10.1007/s12571-024-01488-3>.
- Nurlaela, Emi, and Dian Kartikasari. "Health Assessment of Women in Reproductive Age as Expectant Mothers Through Body Mass Index Examination," 268–73, 2024. [https://doi.org/10.2991/978-2-38476-118-0\\_30](https://doi.org/10.2991/978-2-38476-118-0_30).
- Piché, Marie-Eve, André Tchernof, and Jean-Pierre Després. "Obesity Phenotypes, Diabetes, and

- Cardiovascular Diseases.” *Circulation Research* 126, no. 11 (May 22, 2020): 1477–1500. <https://doi.org/10.1161/CIRCRESAHA.120.316101>.
- Rosmiati, Risti, Nila Reswari Haryana, Hardi Firmansyah, and Rasita Purba. “Pola Makan, Aktivitas Fisik Dan Obesitas Pada Pekerja Urban Di Indonesia.” *Amerta Nutrition* 7, no. 2SP (December 31, 2023): 164–70. <https://doi.org/10.20473/amnt.v7i2SP.2023.164-170>.
- Ruiz, Lyndsey D., Michelle L. Zuelch, Sarah M. Dimitratos, and Rachel E. Scherr. “Adolescent Obesity: Diet Quality, Psychosocial Health, and Cardiometabolic Risk Factors.” *Nutrients* 12, no. 1 (December 23, 2019): 43. <https://doi.org/10.3390/nu12010043>.
- Rusyantia, Anggun, Ali Khomsan, Clara Meliyanti Kusharto, and Hadi Pratomo. “Personal Factors Influencing the Motivation to Engage in Healthy Life Behavior: A Qualitative Study among Indonesian Obese Adult Women.” *International Journal Of Community Medicine And Public Health* 10, no. 1 (December 29, 2022): 29. <https://doi.org/10.18203/2394-6040.ijcmph20223522>.
- Silvestris, Erica, Giovanni de Pergola, Raffaele Rosania, and Giuseppe Loverro. “Obesity as Disruptor of the Female Fertility.” *Reproductive Biology and Endocrinology* 16, no. 1 (December 9, 2018): 22. <https://doi.org/10.1186/s12958-018-0336-z>.
- Thapa, Subash, Kedir Y. Ahmed, Habtamu Mellie Bizuayehu, M. Mamun Huda, Binaya Chalise, Meless G. Bore, Sewunet Admasu Belachew, et al. “Trends and Social Determinants of the Obesity Epidemic among Reproductive-Age Women in Ten Asian Countries.” *Scientific Reports* 14, no. 1 (September 29, 2024): 22545. <https://doi.org/10.1038/s41598-024-73522-5>.
- Wang, Mingliang, Li Bai, Shunlong Gong, and Lian Huang. “Determinants of Consumer Food Safety Self-Protection Behavior-- an Analysis Using Grounded Theory.” *Food Control* 113 (July 2020): 107198. <https://doi.org/10.1016/j.foodcont.2020.107198>.
- Wibowo, Arif, Sofyan Cholid, Annisah, and Johanna Debora Imelda. “Effects of Peers on Obesogenic Behavior in Indonesia’s Adolescents: A Case Study of Adolescents in the Provinces of DI Yogyakarta, South Kalimantan, and Bali,” 2021. <https://doi.org/10.2991/assehr.k.210531.007>.
- Yong, Wei, Jiajia Wang, Yan Leng, Lijie Li, and Han Wang. “Role of Obesity in Female Reproduction.” *International Journal of Medical Sciences* 20, no. 3 (2023): 366–75. <https://doi.org/10.7150/ijms.80189>.

#### **AUTHOR(S) BIOGRAPHY**

dr. Elvie Febriani Dunga, M.Kes, is a lecturer and researcher at the Faculty of Medicine, Gorontalo State University (UNG). She is actively involved in community service activities, such as providing balanced nutrition counseling for pregnant women and conducting Basic Life Support training in the coastal communities of Molotabu. Her scholarly work covers topics such as child nutrition status and the impact of social media on adolescent sexual knowledge, which have been published in prominent health journals.

Prof. Widya Hary Cahyati, S.KM., M.Kes., is a lecturer and researcher in the Department of Public Health, Faculty of Sports Science, Semarang State University (UNNES). She has a broad research interest in public health, focusing on clean and healthy lifestyle behaviors (PHBS), infectious disease prevention, and health promotion among students and communities.