ANNUAL REPORT 2024: SURVEY OF DEMOGRAPHIC DATA AND PREVALENCE OF HEALTH RISK FACTORS IN NAYAO, CHACHOENGSAO PROVINCE, THAILAND

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Abstract

Background: Rural communities in Thailand continue to face a dual burden of chronic noncommunicable diseases (NCDs), mental health concerns, and preventable infectious diseases. Annual community surveys provide essential evidence for local health planning.

Methods: A cross-sectional survey was conducted in December 2024 in Na Yao, Tha Kradan Subdistrict, Chachoengsao Province. Standardized electronic questionnaires (REDCap), physical examinations, and laboratory investigations were used to assess demographic characteristics, metabolic risk factors, accidents, cancer screening, osteoporosis, musculoskeletal symptoms, mental health, and parasitic infections. Statistical analyses included descriptive statistics, Chi-square or Fisher's exact tests, and prevalence rate ratios.

Results: Of 730 participants, 594 were adults aged ≥20 years. Hypertension (36.1%), obesity (32.8%), dyslipidemia (16.8%), and diabetes (13.3%) were the most common NCDs, with hypertension more prevalent among those with lower educational attainment (44.1% vs. 27.9%, $p < 0.05$). Cancer screening uptake was highest for cervical (28.3%) and lung cancer (27.6%), but lower for colorectal (14.2%) and hepatobiliary cancers (13.3%). Osteoporosis risk varied across villages (7.4–13.0% by FRAX®; 6.8–18.7% high risk by OSTA). Musculoskeletal pain was common, with chronic knee pain affecting over half of adults in some clusters. Stress affected nearly one-third of participants and was significantly associated with female sex, smoking, lower educational attainment, and limited mental health care access. Parasitic infections were rare, but hookworm was associated with a lack of footwear, and Taenia spp. with the consumption of raw vegetables.

Conclusion: This Annual Report 2024 highlights substantial burdens of NCDs, stress, musculoskeletal disorders, and preventable injuries, alongside persistent gaps in cancer screening and parasitic infection risks. Targeted, community-based interventions are urgently needed to address both chronic and communicable health challenges in rural Thailand.

Keywords: cancer screening; demographics; epidemiology; mental health; noncommunicable diseases; osteoporosis; parasitic infections; rural population

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Introduction

Community-based health surveys are essential tools for identifying health risks and informing targeted interventions, particularly in rural areas where healthcare resources may be limited. In Thailand, the burden of noncommunicable diseases (NCDs) has risen steadily over the past two decades, with cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers contributing to nearly 75% of all deaths nationwide.[1] In addition, modifiable behavioral risk factors such as tobacco use, alcohol consumption, unhealthy diet, and physical inactivity remain highly prevalent across communities.[2]

Rural communities face unique health challenges related to socioeconomic disparities, limited access to preventive services, and persistent exposure to environmental and infectious disease risks. Osteoporosis and related fractures are emerging public health concerns in aging Thai populations, yet routine screening and preventive strategies are often underutilized.[3] Cancer screening programs, particularly for cervical and colorectal cancers, have been implemented nationally, but uptake remains inconsistent across provinces and community settings.[4] At the same time, parasitic infections, though declining, continue to affect rural households, especially in areas with traditional dietary practices such as consumption of raw or undercooked meat. [5]

Na Yao, a community in Sanam Chai Khet District of Chachoengsao Province, represents a typical semi-rural Thai setting where NCDs, osteoporosis, cancer screening coverage, mental health challenges, and parasitic infections converge. Regular health surveys in such communities can provide valuable insights into local epidemiology and guide both preventive and treatment strategies. The objective of this study was to present demographic characteristics and the prevalence of major health risk factors in Na Yao during 2024, as part of an annual surveillance initiative. Findings from this report aim to inform local health planning and contribute to broader efforts to strengthen primary care and preventive health services in rural Thailand.

Methods

Study design and setting

The study was ethically approved by the Institutional Review Board of the Royal Thai Army Medical Department (Number S053q/58). This cross-sectional study was conducted in Na Yao, Tha Kradan Subdistrict, Sanam Chai Khet District, Chachoengsao Province, from 13 to 19 December 2024. Data were collected using standardized electronic questionnaires (I-survey) via the REDCap platform[6,7] supplemented by physical examinations and laboratory investigations. The fieldwork was carried out by third-year medical cadets from Phramongkutklao College of Medicine under faculty supervision, in collaboration with community health volunteers and local representatives. Prior to data collection, a geo-social mapping survey of the community was conducted to facilitate sampling and household coverage.

Study population

The survey population consisted of residents from Village No. 11 (Ban Thung So Hong), Village No. 16 (Ban Na Isan), Village No. 18 (Ban Thung Hiang), and Village No. 19 (Ban Na Ngam). A total of 15 residential clusters (Khum) with 1,597 individuals were enumerated, of whom 730 residents participated in the study. Cluster populations ranged from 42 to 262 residents. The stress survey was administered to participants aged ≥15 years, while surveys on hypertension, diabetes, dyslipidemia, and obesity were limited to individuals aged ≥20 years. Participants aged ≥40 years were screened for osteoporosis. In addition, we assessed accident risks, parasitic infections, and other community health issues across all age groups.

Research tools and measurements

Community assessment tools included a walking map, kinship charts, organizational structure diagrams, and health system mapping, which provided socio-cultural context. Health assessments employed standard equipment: digital and mercury sphygmomanometers for blood pressure, weighing scales and stadiometers for anthropometry, measuring tapes for waist circumference, and stethoscopes. Laboratory investigations included the collection of fecal and urine samples for microscopic examination, rapid diagnostic tests, and chemical analyses for parasitic infections. The Case Report Form (CRF) on REDCap contained three domains: (1) household census, (2) general information, and (3) health issues by age group. The CRF was developed through literature review, expert consultation, and pilot testing.

Data Collection

Data collection was conducted via structured electronic interviews in REDCap, supplemented by physical examinations and laboratory investigations. Household interviews captured demographic information such as age, sex, education, and occupation, along with self-reported histories of hypertension, diabetes, dyslipidemia, obesity, smoking, alcohol use, and physical activity.

Cancer data were obtained from individuals aged 18–75 years, including household reports of any cancer diagnosis within the past year, type of cancer, and whether the affected individual had died. Cancer screening was defined as tests performed for preventive purposes in asymptomatic individuals. Lung cancer screening refers to an annual chest X-ray performed as part of routine screening, not for the investigation of respiratory symptoms. Cervical cancer screening includes a Pap smear. Colorectal cancer screening includes fecal occult blood testing or the fecal immunochemical test (FIT). These definitions were clearly explained to participants during interviews to distinguish screening procedures from diagnostic tests. Additional questions assessed risk factors such as smoking history, secondhand smoke exposure, alcohol intake, dietary habits, and occupational or environmental exposures, as well as barriers to screening and previous participation in national cancer screening programs.

Osteoporosis data were collected from participants aged ≥40 years. The FRAX® score (8) was applied to estimate 10-year probabilities of hip and major osteoporotic fractures. In addition, the Osteoporosis Self-Assessment Tool for Asians (OSTA)(9) was calculated using the formula (weight in kg – age in years) × 0.2, and participants were categorized as low risk (> –1), intermediate risk (–1 to –4), or high risk (≤ –4) for osteoporosis. The Nordic Musculoskeletal Questionnaire (10) was also used to assess musculoskeletal pain by anatomical site.

Mental health data were collected from participants aged 15 years and older using a standardized stress questionnaire, the Suanprung Stress Test-20 (SPST-20), and additional questions on access to community mental health care. Stress scores were categorized as low (0–23), moderate (24–41), or high/severe (≥42).[11]

Accident data were collected across all age groups. Participants were asked about accident history in the past year, the most recent lifetime accident, and related factors, including work environment, use of protective equipment, job fatigue, and adequacy of safety training. We recorded details on the type of accident, activity at the time of injury, affected body parts, and medical care received.

Information on parasitic infections was collected for all age groups. Stool and urine samples were examined for *Strongyloides stercoralis, Blastocystis hominis, Taenia* spp., and *Opisthorchis viverrini* using microscopy and rapid diagnostic tests. Risk behaviors, including footwear use, drinking water source, and consumption of raw or undercooked foods, were documented to assess associations with parasitic infection.

Finally, a metabolic syndrome questionnaire was administered to individuals aged 20 years and older, which included self-reported histories of diabetes, hypertension, and high cholesterol, as well as lifestyle information such as dietary patterns, alcohol consumption, smoking, and physical activity. These data were later analyzed to estimate the prevalence of metabolic syndrome and associated risk factors.

Statistical analysis

Data were entered into REDCap and analyzed using R version 4.4.0. Descriptive statistics (mean, standard deviation, frequency, percentage) were used to summarize demographic and health risk factor data. Inferential statistics included Chi-square tests and Fisher's exact tests for categorical variables. Prevalence ratios (PR) were calculated where applicable. For osteoporosis, fracture risk was categorized using FRAX® thresholds (>20% for major fractures, >3% for hip fractures). For mental health, stress levels were classified into low, moderate, and severe categories. A community social network and geo-social map were constructed to visualize patterns and prioritize community health issues. Statistical significance was set at $p < 0.05$.

Results

Characteristics of participants

Demographic data is shown in **Table 1**. A total of 730 residents from village no. 11, 16, and 18 in Na-Yao were included in the survey. The sample comprised 38.4% males (n = 280) and 61.6% females (n = 450), with a mean age of 47.6 years (SD = 22.7, range 0–91) and a median age of 53 years (IQR 32–64). Nearly one-fifth (18.6%) were aged ≤19 years, while 27.0% were aged ≥60 years, reflecting a relatively aging population. Most participants reported practicing Buddhism (99.3%), with only a small minority identifying as Christian (0.1%) or Muslim (0.5%). Marital status data (n = 728) indicated that 62.1% were married, 28.0% single, and 9.9% were widowed, separated, or divorced.

Regarding occupation (n = 719), agriculture was the most common form of employment (45.1%), followed by students (16.8%), employees (13.8%), and government officers (2.1%), while 21.8% reported other forms of work. Educational attainment (n = 576) was generally low, with the majority completing only primary school (60.6%), and fewer achieving junior high (9.5%), senior high (12.3%), or higher education (6.8%). Health coverage data (n = 608) showed that most residents were protected under Thailand's Universal Health Coverage scheme (85.2%), while smaller groups relied on government/state enterprise benefits (4.6%), social security (3.9%), or self-payment (2.3%). Monthly income (n = 656) was generally low, with 72.6% earning <10,000 THB and only 27.4% reporting ≥10,000 THB. Body mass index (BMI) data (n = 572, adults ≥20 years) indicated a mean BMI of 23.9 kg/m² (SD = 4.4). Based on Asia-Pacific BMI classification, 39.5% had normal weight, 18.2% were overweight, and 34.1% were obese (Class I: 24.8%, Class II: 9.3%), while 8.2% were underweight.

Occupational accident incidents

In the past year, 11.7% of participants (90 of 771) reported experiencing a severe accident, while 88.3% (681 of 771) had no such event. The most common cause was road traffic accidents, which accounted for 59.9% of all cases (185 of 309). Slips and falls were the second most frequent cause (25.2%, 78 of 309), followed by accidents involving tools or machinery (7.1%, 22 of 309). Less common causes included chemical exposure (3.0%), fires or explosions (0.3%), and animal-related injuries (0.3%). Other accidents comprised 4.2% of cases.

When stratified by sex, accident prevalence was slightly higher among males (15.1%, 45 of 298) compared to females (9.5%, 45 of 473), and this difference was statistically significant ($p = 0.019$). However, the distribution of accident types did not differ substantially between men and women; both groups experienced the highest burden from road traffic accidents (59.0% in men, 60.6% in women), followed by slips and falls (23.1% and 26.9%, respectively).

Cancer screening

Cancer screening participation varied across cancer types and sex. Among 336 adults screened for general cancers, the most common test was lung cancer screening, completed by 27.6% (93 of 336), followed by colorectal cancer screening at 14.2% (48 of 336) and hepatobiliary cancer screening at 13.3% (45 of 336). Among 501 women surveyed, 28.3% (142 of 501) reported undergoing cervical cancer screening, and 15.9% (80 of 501) had breast cancer screening. Cervical and lung cancer screening were the most

Table 1. Demographic data of villages no.11,16, and 18 of Tha Kradan Subdistrict, Na-Yao village, Chachoengsao province in 2024 (N = 730)

	n (%)
Sex (n=730)	
Male	280 (38.4)
Female	450 (61.6)
Age (years) (n=730)	
Mean ± S.D. (min-max)	47.6 ± 22.7 (0.0-91.0)
Median (Q1-Q3)	53.0 (32.0-64.0)
≤ 19	136 (18.6)
20-29	33 (4.5)
30-39	56 (7.7)
40-49	88 (12.1)
50-59	161 (22.1)
60-69	135 (18.5)
70-79	90 (12.3)
≥ 80	31 (4.2)
Religion (n=730)	
Buddhism	725 (99.3)
Christianity	1 (0.1)
Islam	4 (0.5)
Others	0 (0.0)
Marital status (n=728)	
Single	204 (28.0)
Married	452 (62.1)
Widowed	51 (7.0)
Separated	10 (1.4)
Divorced	11 (1.5)
Occupation (n=719)	
Agriculturist	324 (45.1)
Student	121 (16.8)
Employee	99 (13.8)
Government Officer	15 (2.1)
Company Employee	3 (0.4)
Others	157 (21.8)
Highest Education Level (n=576)	
No Education	37 (6.4)
Below Primary	17 (3.0)
Primary School	349 (60.6)
Junior High School	55 (9.5)
Senior High School	71 (12.3)
Associate degree	11 (1.9)
Bachelor's Degree or Higher	28 (4.9)
Other Education	8 (1.4)
Healthcare Coverage (n=608)	
Universal Health Coverage	518 (85.2)
Government/State Enterprise Benefits	28 (4.6)
Social Security	24 (3.9)
Self-Payment	14 (2.3)
Others	24(3.0)
Monthly Income (THB) (n=656)	
<10,000 THB	476 (72.6)
≥10,000 THB	180 (27.4)

Table 1. Demographic data of villages no.11,16, and 18 of Tha Kradan Subdistrict, Na-Yao village, Chachoengsao province in 2024 (N = 730) (cont.)

	n (%)
Body mass index* (unit: kg/m^2) (n=572)	
Mean ± S.D. (min-max)	23.86 ± 4.38 (12.57-39.04)
Median (Q1-Q3)	23.42 (20.79-26.36)
Underweight	47 (8.2)
Normal weight	226 (39.5)
Overweight	104 (18.2)
Obesity Class I	142 (24.8)
Obesity Class II	53 (9.3)

[1]n (%); Mean ± SD (Min-Max) Median (Q1-Q3)

S.D.; Standard deviation

*Body mass index (BMI) criteria from the Asia-Pacific body mass index classification by participants aged ≥ 20 years

commonly performed, suggesting relatively higher awareness and uptake. By contrast, screening rates for colorectal and hepatobiliary cancers were substantially lower, reflecting gaps in community participation and awareness.

Osteoporosis and musculoskeletal disorders

For the FRAX® 10-year fracture risk among adults aged 40–90 years, the estimated probability of major osteoporotic fractures ranged between 7.4% and 13.0% across areas. The highest risk was observed in Ban Na Isan (13.0%), while the lowest was in Thung Hiang–Khlong Phawa–Pa Ngio Ngam (7.4%). The risk of hip fractures was much lower, ranging from 0.0% to 1.6%, with Thung So–Na Kham showing the highest prevalence (1.6%). Notably, in all groups, the predicted risk of major osteoporotic fractures exceeded that of hip fractures.

In the OSTA high-risk screening conducted among 429 adults aged 40–90 years, the prevalence of high-risk individuals varied by area. The highest proportions were recorded in Thung So Hongsa–Na Kham (18.7%) and Phu Ngam (13.5%), while other groups ranged between 6.8% and 11.8%. These findings indicate geographic variation in osteoporosis risk, with certain sub-villages demonstrating greater vulnerability.

For the musculoskeletal symptoms assessed with the Nordic Musculoskeletal Questionnaire in Khum Non-Sa-at (n = 44), the knee was consistently the most affected site across all measures. Chronic knee pain was reported by more than half of participants (52.3%), while recent or severe knee symptoms affected 20.5% and acute knee pain was reported by 29.5%. The lower back and hip were the following most common problem areas, with chronic pain affecting 31.8% in each, and acute symptoms present in 25.0%. These results highlight the burden of musculoskeletal problems, particularly knee disorders, in this population.

Parasitic infections and behaviors

Parasitic infections were uncommon in the study population. *Strongyloides stercoralis* infection was detected in 3 of 253 participants (1.2%) and was not significantly associated with footwear use (p = 0.438). *Blastocystis* spp. infection was found in 4 of 253 participants (1.6%) and was not associated with drinking water source (p = 1.000). *Taenia spp*. infection was identified in 2 of 258 participants (0.8%); no associations were observed with raw pork or beef consumption, but infection was significantly associated with raw vegetable consumption (p = 0.035). *Opisthorchis viverrini* infection was detected in only 1 of 258 participants (0.4%) and was not associated with consumption of raw fish, shellfish, or crab (p = 1.000 for all). Hookworm infection was observed in 1 of 253 participants (0.4%) and was significantly associated with not wearing shoes (p = 0.032).

Stress and associated factors

Stress levels were evaluated among 624 participants aged ≥15 years. Most respondents reported low stress (71.8%), while 21.6% reported moderate stress and 6.6% reported high to severe stress, indicating that nearly one in three adults experienced moderate to severe stress. In univariate analyses, female sex (p = 0.001), lower educational attainment (p = 0.037), current smoking (p = 0.039), and lower levels of community mental health care (p = 0.029) were associated with high-to-severe stress. Age, hypertension, diabetes, obesity, marital status, income, alcohol, sleep, exercise, and sedentary time showed no significant associations (**Table 2**).

Hypertension and associated factors

The overall prevalence of metabolic conditions among adults aged ≥20 years in the study area was considerable. Diabetes affected 13.3% (n = 594), dyslipidemia 16.8%, and obesity 32.8%, while hypertension was the most common, affecting 36.1% (n = 565). Focusing on hypertension, when stratified by sex, prevalence was slightly higher in males (38.0%) compared to females (35.0%), though the difference was not statistically significant (p = 0.517). Education level showed a significant association with hypertension. Individuals with education below junior high school had a markedly higher prevalence (44.1%) compared to those with junior high school or higher (27.9%), corresponding to a prevalence ratio (PR) of 1.58 ($p < 0.05$). Other lifestyle factors, including sleep duration, physical activity, sedentary behavior, consumption of sweet foods and beverages, sugar addition, and fatty food intake, were not significantly associated with hypertension. Although lower prevalence rates were observed among individuals who exercised ≥150 minutes per week (33.7%) and those consuming sweets 4–6 days per week (26.7%), the differences were not statistically significant (**Table 3**).

Table 2. Factors associated with stress among individuals aged 15 years and older using Pearson's Chi-Squared Test and Fisher's Exact Test (N = 624)

	Low to Moderate Stress n (%)	High to Severe Stress n (%)	*p*-value
Sex			**0.001[1]
Male	227 (97.8)	5 (2.2)	
Female	356 (90.8)	36 (9.2)	
Age (years)	55 (IQR 45, 66)	49 (IQR 35, 65)	0.071[2]
Age Group			0.1[2]
Teenager (15-25)	43 (86.0)	7 (14.0)	
Adult (26-64)	360 (94.2)	22 (5.8)	
Elder (65+)	171 (93.9)	11 (6.1)	
Hypertension			0.2[1]
No	337 (93.4)	24 (6.6)	
Yes	196 (96.1)	8 (3.9)	
Diabetes			>0.9[2]
No	479 (93.9)	31 (6.1)	
Yes	77 (95.1)	4 (4.9)	
Obesity			>0.9[1]
No	397 (93.6)	27 (6.4)	
Yes	186 (93.0)	14 (7.0)	
Marital Status			0.2[2]
Single	88 (88.0)	12 (12.0)	
Married	426 (94.5)	25 (5.5)	
Widowed	47 (92.2)	4 (7.8)	

Table 2. Factors associated with stress among individuals aged 15 years and older using Pearson's Chi-Squared Test and Fisher's Exact Test (N = 624) (cont.)

	Low to Moderate Stress n (%)	High to Severe Stress n (%)	*p*-value
Separated	10 (100.0)	0 (0.0)	
Divorced	11 (100.0)	0 (0.0)	
Highest Education Level			**0.037[2]
No education	33 (89.2)	4 (10.8)	
Below primary education	11 (68.8)	5 (31.3)	
Primary school	316 (94.6)	18 (5.4)	
Junior high school	45 (90.0)	5 (10.0)	
Senior high school	66 (94.3)	4 (5.7)	
Associate degree	11 (100.0)	0 (0.0)	
Bachelor's degree or higher	26 (92.9)	2 (7.1)	
Other education	8 (100.0)	0 (0.0)	
Occupation			0.2[1]
No	158 (90.8)	16 (9.2)	
Yes	416 (94.3)	25 (5.7)	
Alcohol Consumption			0.4[1]
No	236 (94.4)	14 (5.6)	
Yes	319 (92.5)	26 (7.5)	
Smoking			**0.039[1]
No	147 (97.4)	4 (2.6)	
Yes	407 (95.2)	35 (7.8)	
Income (THB per month)			0.6[1]
Less than 10,000	367 (93.4)	26 (6.6)	
10,000 or more	171 (95.0)	9 (5.0)	
Community Mental Health Index			**0.029[2]
Very low	31 (91.2)	3 (8.8)	
Low	35 (81.4)	8 (18.6)	
Moderate	24 (92.3)	2 (7.7)	
High	3 (100.0)	0 (0.0)	
Very high	490 (94.6)	28 (5.4)	

Note: Total numbers for some variables may not equal 624 due to missing responses and age-specific eligibility criteria.

**Statistical significance at p-value ≤ 0.05*

[1]Pearson's Chi-squared test; Wilcoxon rank sum test

[2]Fisher's exact test; Wilcoxon rank sum test

Discussion

This community-based survey in Na Yao, Chachoengsao Province, provides updated evidence on the demographic and health risk profile of rural Thai populations. The study revealed a high burden of noncommunicable diseases (NCDs), musculoskeletal disorders, stress, and accident-related injuries, alongside gaps in cancer screening and persistent parasitic infections. These findings highlight critical challenges for community health and inform future prevention strategies in Thailand and the broader Southeast Asian region.

Table 3. Factors associated with hypertension using Chi-square and prevalence rate ratio among adults (age ≥ 20) in village no. 11, 16, and 18, Tha Kradan Subdistrict, Sanam Chai Khet District, Chachoengsao Province, 2024 (N=605)

	Total	Hypertension				PR	*p*-value
		Yes	%	No	%		
Sex							0.5170
Male	229	87	38.0	142	62.0	1.000	
Female	374	131	35.0	243	65.0	0.922	
Education level							
Higher than junior high school	147	41	27.9	106	72.1	1.000	
Below junior high school	365	161	44.1	234	55.9	1.582	
Sleep 7-9 hr/day							0.3183
6-7 days/week	328	127	38.7	201	61.3	1.000	
3-5 days/week	104	35	33.7	69	66.3	0.869	
0-2 days/week	173	56	32.4	117	67.6	0.836	
Exercise							0.5191
≥150 mins/week	86	29	33.7	57	66.3	1.000	
<150 mins/week	124	50	40.3	74	59.7	1.196	
Never	395	139	35.2	256	64.8	1.044	
Sedentary Lifestyle > 2 hr/day							0.5344
0-2 days/week	326	111	34.1	215	65.9	1.000	
3-5 days/week	130	49	37.7	81	62.3	1.107	
6-7 days/week	149	58	38.9	91	61.1	1.143	
Eating sweet							0.3000
Never	211	84	39.8	127	60.2	1.000	
1-3 days/week	261	92	35.3	169	64.7	0.885	
4-6 days/week	60	16	26.7	44	73.3	0.700	
Everyday	73	26	35.6	47	64.4	0.895	
Drinking sweet beverages							0.1044
Never	250	104	41.6	146	58.4	1.000	
1-3 days/week	225	74	32.9	151	67.1	0.790	
4-6 days/week	54	18	33.3	36	66.7	0.801	
Everyday	76	22	28.9	54	71.1	0.700	
Adding sugar/syrup in food							0.0883
Never	228	80	35.1	148	64.9	1.000	
Sometime	213	88	41.3	125	58.7	1.177	
Every time	164	50	30.5	114	69.5	0.870	

Table 3. Factors associated with hypertension using Chi-square and prevalence rate ratio among adults (age ≥ 20) in village no. 11, 16, and 18, Tha Kradan Subdistrict, Sanam Chai Khet District, Chachoengsao Province, 2024 (N=605) (cont.)

	Total	Hypertension				PR	*p*-value
		Yes	%	No	%		
Eating fatty food							0.4102
Never	118	49	41.5	69	58.5	1.000	
1-3 days/week	263	96	36.5	167	63.5	0.879	
4-6 days/week	121	38	31.4	83	68.6	0.756	
Everyday	103	35	33.9	68	66.1	0.818	

Note: Total N refers to eligible participants aged ≥20 years; category totals may vary due to missing data

Severe accidents affected 11.7% of participants, with road traffic accidents accounting for the majority, followed by slips and falls. The prevalence was significantly higher among men, although accident types were similar across sexes; this corresponds with national road safety statistics identifying rural male populations as disproportionately affected.[12,13] Community-level interventions, including road maintenance, helmet promotion, and fall-prevention strategies for agricultural workers, are urgently warranted.

While cervical (28.3%) and lung cancer screening (27.6%) showed moderate uptake, colorectal (14.2%) and hepatobiliary (13.3%) screening rates were markedly lower; this mirrors previous reports of underutilization of colorectal cancer screening in Thailand, despite national policies promoting fecal immunochemical testing (FIT) for adults aged 50–75 years(14). Barriers identified in our survey—including structural and knowledge-related challenges—are consistent with studies from rural Thailand and other ASEAN countries, where distance to facilities, fear of diagnosis, and limited awareness reduce participation. [15,16] Targeted interventions that address these barriers, combined with health system strengthening, are urgently needed to improve cancer prevention outcomes.

Osteoporosis risk, assessed by both FRAX® and OSTA, varied between communities, with some clusters (e.g., Ban Na Isan, Thung So–Na Kham) demonstrating higher predicted risks. Similar to prior studies, fracture risk was consistently higher for major sites than for hip fractures, but still warrants preventive action given Thailand's rapidly aging population[17]. Musculoskeletal pain, particularly chronic knee pain, was highly prevalent—over half of adults in Khum Non-Sa-at reported chronic knee pain; this aligns with Thai epidemiological data indicating knee osteoarthritis as a major contributor to disability in rural areas.[18] Targeted interventions to prevent musculoskeletal morbidity—including weight control, physical activity promotion, and early physiotherapy—should be prioritized.

Although overall prevalence was low, behavioral associations were evident. Hookworm infection was significantly linked to not wearing shoes, and Taenia spp. infection associated with the consumption of raw vegetables. These findings are in line with previous Thai studies demonstrating that foodborne and soil-transmitted parasites remain endemic in rural communities, particularly where traditional dietary practices persist.[19,20] Public health education campaigns and sustained school-based deworming remain essential strategies.

Nearly one-third of participants reported moderate-to-severe stress, with significant associations observed for female sex, smoking, lower educational attainment, and limited access to mental health care. These findings echo prior studies indicating that women in Thailand face greater psychosocial stress burdens due to caregiving roles and economic vulnerability. [21] The observed relationship between smoking

and high stress may reflect bidirectional pathways, where stress contributes to tobacco use, and smoking exacerbates stress physiology.[22] Importantly, limited access to community-based mental health services emerged as a determinant of higher stress levels, reinforcing the need for accessible primary-level psychosocial support.

The prevalence of hypertension (36.1%), obesity (32.8%), dyslipidemia (16.8%), and diabetes (13.3%) among adults aged ≥20 years in this study was substantial, with hypertension emerging as the most common condition. These estimates are consistent with national surveys, such as the 6th Thai National Health Examination Survey (NHES VI), which reported hypertension prevalence of 25–30% and obesity rates exceeding 30% among adults.[2] Our analysis further revealed that lower educational attainment was significantly associated with higher hypertension prevalence, underscoring the role of social determinants of health. Education-related disparities in hypertension and NCD risk have been documented both in Thailand and globally, reflecting differences in health literacy, lifestyle, and access to preventive care.[23,24]

This study represents one of the few comprehensive, community-level health surveys conducted in Chachoengsao Province, using standardized instruments, including REDCap, FRAX®, OSTA, the Nordic Musculoskeletal Questionnaire, and the SPST-20. It integrated both self-reported and objective measures, providing a broad picture of health risks. However, several limitations should be acknowledged. First, the cross-sectional design precludes causal inference. Second, some denominators varied due to age-specific eligibility and missing data, potentially affecting representativeness. Third, self-reported behaviors may be subject to recall or social desirability bias. Despite these limitations, the findings remain valuable for guiding local health policy and interventions.

To improve community health outcomes, integrated strategies should be implemented, including strengthening NCD screening and follow-up systems at the primary healthcare level, expanding mobile cancer screening units, enhancing community-based mental health services, promoting lifestyle modification through health literacy campaigns, and implementing fall-prevention and physical activity programs for older adults. Community engagement, village health volunteers, and local government collaboration are essential to ensure sustainable interventions and reduce health disparities.

Conclusion

This Annual Report 2024 from Na Yao, Chachoengsao Province, highlights the health profile of a rural Thai community, revealing a high prevalence of hypertension and obesity, uneven participation in cancer screening, notable levels of stress linked to social and behavioral determinants, musculoskeletal pain and osteoporosis risk in older adults, low but behavior-associated parasitic infections, and a substantial burden of road traffic and fall-related accidents. These findings underscore the dual challenges of chronic disease and preventable health risks, and reaffirm the value of annual community surveys in guiding local health planning, monitoring trends, and informing interventions aimed at reducing inequities, strengthening preventive care, and improving population health outcomes.

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