

## Announcements

## The 14<sup>th</sup> National Healthy Lifestyle Day — September 1, 2020

To encourage its residents to stop unhealthy habits and become a practitioner and beneficiary of healthy lifestyles, the Chinese government initiated the China Healthy Lifestyle for All (CHLA) in 2007. It is celebrated annually on September 1 and was named the National Healthy Lifestyle Day. The theme for this year is “Increase Health Promotion, Decrease Oil Consumption”.

The burden of non-communicable diseases (NCDs) continues to be a major public health challenge globally and in China. Globally, physical inactivity was responsible for 9% of premature mortality, insufficient fruit and vegetable consumption for 11.3%, and harmful alcohol consumption for 5.3% (1–3). The scientific evidence strongly supports changing dietary habits and physical activity habits can powerfully influence several of these risk factors at the population level. Since the initiation of CHLA in 2007, the atmosphere of “Health for all, participation for all” gradually formed. By the end of 2018, 2,627 counties/districts carried out the action, which accounted for 88.78% of all counties/districts in China (4). The content of CHLA was further expanded in 2016 and included less salt, less oil, less sugar, oral health, healthy weight, and healthy bones. Within the coming 10 years and with the construction of a healthy environment, dissemination of health knowledge, promotion of a healthy lifestyle, the nation’s health will be further improved.

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## Preplanned Studies

## Leisure-Time Physical Activity Among Chinese Adults — China, 2015

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### Summary

#### What is already known on this topic?

Leisure-time physical activity (LTPA) such as sports, fitness, and recreation, is well documented to prevent chronic disease and improve health. The age-adjusted prevalence of regular LTPA was only 11.9% among Chinese adults in China in 2010. It has been reported that the age-adjusted LTPA prevalence increased from 7.13% in 2000 to 11.79% in 2011.

#### What is added by this report?

According to the latest available data, in 2015, the prevalence of LTPA and regular LTPA was 19.7% and 12.5% in adults aged 18 years old and above, respectively. Both LTPA and regular LTPA were lower in rural areas than in urban areas, higher in people with higher socioeconomic position, and varied across provinces.

#### What are the implications for public health practice?

To promote more people, especially those with lower socioeconomic position to participate in LTPA, great efforts are required to strengthen national and local policy initiatives, financial support, sports facility construction, and health education, especially in rural areas and in western China.

Leisure-time physical activity (LTPA), which includes sports, fitness, and recreational activities, is well-documented as being able to reduce the burden of chronic disease, prevent early death, and improve health. About 83.8% of adults did not engage in LTPA, and regular LTPA was only reported by 11.9% of adults in China in 2010. In order to understand the latest status of LTPA in China, data from the China Chronic Disease and Nutrition Surveillance (CCDNS), a nationally and provincially representative cross-sectional survey, were analyzed, and the prevalence of LTPA and regular LTPA were

determined based on face-to-face interviews with a Global Physical Activity Questionnaire (GPAQ). Key demographic and geographic factors were analyzed via Rao Scott chi-square tests and logistic regression models. This study showed that the prevalence of LTPA and regular LTPA increased from the past but remained at relatively low levels among adults in China. LTPA presented important socioeconomic and geographic inequality. More effort should be made to promote the implementation of the national fitness program, including the construction of public sports facilities, opening more sports venues, developing a variety of fitness activities and special sports items, and strengthening sports education in schools.

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure (1). The Global Burden of Disease (GBD) study estimated that low levels of physical activity accounted for 1.3 million premature deaths and 2.4 million disability-adjusted life-years (DALYs) worldwide in 2017 (2). To achieve a target of 15% relative reduction in the global prevalence of physical inactivity in adults and in adolescents by 2030, the World Health Organization (WHO) has released the “Global action plan on physical activity 2018–2030: more active people for a healthier world” (3). A target of 435 million people regularly exercising by 2020 has also been included in Healthy China 2030 and a national fitness program was implemented in 2016 to improve the physical fitness and health level of the whole nation. Compared to other domains of physical activity, such as for work, for housework, and for transportation, LTPA was found to be better for preventing cardiovascular disease and protecting cognition (4). In China, 83.8% of adults reported no LTPA, and only 11.9% of adults aged 18 years old and above engaged in the regular LTPA in 2010 (5). It was reported that the age-standardized LTPA prevalence increased from 7.13% in 2000 to 11.79% in 2011 (6). While policy initiatives, environmental and financial support, and health education were taken to promote LTPA in China in recent years, little is known about the latest LTPA in China, particularly in rural areas and at the provincial level.

The prevalence of LTPA and regular LTPA among Chinese adults were estimated by using the data from China Chronic Disease and Nutrition Surveillance (CCDNS) in 2015. CCDNS is a periodical cross-sectional survey of major risk factors and major non-communicable and chronic diseases (NCDs), that was conducted in 298 districts/counties acting as

surveillance sites across 31 provincial-level administration divisions (PLADs). The surveillance sites were selected randomly from over 2,400 districts/counties to be representative of the population nationwide as well as in every PLAD and specific regions, including urban and rural areas. A multi-stage, cluster-randomized sampling method was used to select respondents aged 18 years old and above within every district/county (7). Using a set of questionnaires, data on chronic-disease-related behaviors was collected by trained professionals from local CDCs. The information on moderate or vigorous physical activity (MVPA) participation in three domains (work, travel, and recreation) was collected by the Global Physical Activity Questionnaire (GPAQ) (8–9). LTPA was measured by asking participants whether they carried out vigorous or moderate LTPA at least 10 minutes continuously (yes/no), frequency of the activities (days per week), and time spent doing the activities in a typical day. In this study, LTPA was defined as participants engaging in any vigorous or moderate LTPA at least once a week. Regular LTPA was defined as carrying out moderate LTPA or an equivalent at least 30 minutes per day and 3 days or more per week.

In 2015, 189,605 participants from 88,250 households completed the survey, which yielded a 95.4% family response rate and 94.9% individual response rate. After excluding 1,675 participants with incomplete data (0.88%), a final sample of 187,930 participants was analyzed in this study. The study was approved by the Ethical Committee of the National Centre for Chronic and Non-Communicable Disease Control and Prevention, China CDC (Approval Notice: No.201519-A). All participants provided written informed consent.

All statistical analyses were weighted to represent both national and region-specific estimates (10). The weighted proportion for the characteristics of Chinese adults aged 18 years old and above was reported. Chi-square tests were used for comparisons among unordered categorical variables, whereas logistic regression models were used to examine the trend for ordered categorical variables. Taylor linearization methods with a finite population correction were used to estimate standard errors (SE) accounting for the complex sampling design. Statistical significance was determined as a two-sided  $p < 0.05$ . All statistical analyses used software SAS (version 9.4, SAS Institute Inc., Cary, USA).

Among the 187,930 samples in this study, 88,231 men (46.9%) and 99,699 women (53.1%) were

included. In 2015, the prevalence of LTPA among adult residents aged 18 years old and above in China was overall 19.7% (95% confidence interval [CI] : 17.9%–21.4%), in males 22.0% (95% CI: 19.9%–24.1%), and in females 17.3% (95% CI: 15.9%–18.8%). The prevalence of LTPA among residents in urban areas was significantly higher than that in rural areas (28.0% vs. 13.8%,  $p < 0.0001$ ), and the prevalence of LTPA among residents in eastern areas (24.7%, 95% CI: 21.6%–27.9%) was significantly higher than other areas. The current prevalence of LTPA differed greatly between men and women in terms of different education levels, family income levels, and occupations. The prevalence of LTPA increased with education level and household income but decreased with age for both men and women ( $p < 0.0001$ ). According to the analysis of different occupations, the prevalence of LTPA (33.7%, 95% CI: 31.3%–36.0%) among office/shop/other non-manual workers was the highest, and the prevalence of LTPA among farming-related workers (10.6%, 95% CI: 9.7%–11.4%) was the lowest. In 2015, the prevalence of regular LTPA among adult residents aged 18 years old and above in China was overall 12.5% (95% CI: 11.4%–13.5%), in males 13.3% (95% CI: 12.1%–14.6%), and in females 11.6% (95% CI: 10.7%–12.5%). Similar to the prevalence of LTPA among residents, the prevalence of regular LTPA differed greatly between men and women in different residences, geographic locations, education levels, household income, and occupations. (Table 1)

Figure 1 and Figure 2 showed the current provincial geographic distribution of the prevalence of LTPA and regular LTPA, respectively, among adult residents aged 18 and above in China. Figure 1 showed that in 2015, the prevalence of LTPA exceeded 25% in 7 PLADs and was highest in Beijing (44.1%). The prevalence of LTPA in 6 PLADs was less than 14.9%. In Figure 2, the prevalence of regular LTPA in Beijing, Shanghai, Qinghai, Guangdong, Jiangsu, Fujian, and Shandong exceeded 15%, while the prevalence of regular LTPA in Hainan, Sichuan, Chongqing, Hunan, Guizhou, and Xizang (Tibet) Autonomous Region was less than 9.3%.

## DISCUSSION

This study showed that the prevalence of LTPA (19.7%) and regular LTPA (12.5%) remained low in China. The male adults or adults who were living in

urban areas, living in eastern China, had better education, had higher income, and doing non-manual work or retired were more likely to be physically active in their leisure time than their counterparts.

The prevalence of regular LTPA was found to increase slightly from 11.9% in 2010 to 12.5% in 2015. However, the criteria of regular LTPA in the previous study was at least 10 minutes per day and at least 3 days per week, which was less strict the criteria in this study so the estimated prevalence in 2010 would likely be lower than 11.9%. The current prevalence of regular LTPA was far below the prevalence of 46.7% in adults in the United States (11). The gap between urban and rural areas still existed but has narrowed from 11.7% in 2010 to 9.6% in 2015. The main reason might be attributable to the increasing investment in sports facilities in rural areas in recent years. In addition, the prevalence of LTPA and regular LTPA were also lower in undeveloped western regions, compared to central and eastern China.

A previously reported study showed different prevalence of LTPA than that reported in this study (6). However, the questionnaire used in that study differed from the questionnaire used in this study in the design of questions about LTPA. These differences could be explained due to the questionnaire in this study covering a wider range of LTPA.

Our study showed a positive association between socioeconomic position (SEP) and LTPA, which was consistent with the previous studies (12). With an increase of education or income level, people were more likely to be physically active in their leisure time. Also, no-manual workers were more physically active in leisure time than manual workers. Adults with higher SEP were considered to have a better knowledge about the benefit of PA, or have more financial possibilities to participate in LTPA. Furthermore, manual workers, most of whom also might have lower SEP, generally engaged in more occupational PA. A study had shown that fatigue after work was a barrier of LTPA (13).

The comparative estimates of provincial LTPA among all 31 PLADs in China were shown for the first time in our study. The provincial variations in the prevalence of LTPA and regular LTPA were identified, which indicated the potential impacts of geographical feature, leisure life customs, and socioeconomic development. Beijing, as the only host city for the Olympic Games in China, had the highest prevalence of both LTPA and regular LTPA and was 10% more

TABLE 1. Prevalence of LTPA and regular LTPA among Chinese adults aged 18 years old and above at the provincial level in China in 2015<sup>\*</sup>.

Items	Overall			Men			Women		
	N	Prevalence/% (95% CI)		N	Prevalence/% (95% CI)		N	Prevalence/% (95% CI)	
		LTPA	Regular LTPA		LTPA	Regular LTPA		LTPA	Regular LTPA
Total	187,930	19.7 (17.9–21.4)	12.5 (11.4–13.5)	88,231	22.0 (19.9–24.1)	13.3 (12.1–14.6)	99,699	17.3 (15.9–18.8)	11.6 (10.7–12.5)
Age									
18–24 years	6,610	26.6 (24.0–29.3)	14.0 (12.3–15.6)	3,189	31.7 (28.6–34.8)	17.5 (14.7–20.4)	3,421	21.3 (18.6–24.1)	10.2 (8.6–11.8)
25–34 years	21,429	20.7 (18.1–23.4)	11.3 (10.1–12.5)	9,367	26.1 (22.1–30.2)	13.9 (12.2–15.6)	12,062	15.2 (13.6–16.7)	8.6 (7.7–9.6)
35–44 years	29,870	20.3 (18.2–22.5)	12.8 (11.3–14.2)	13,749	22.1 (19.6–24.6)	12.8 (11.2–14.4)	16,121	18.5 (16.6–20.4)	12.8 (11.3–14.3)
45–54 years	47,936	18.5 (17.0–20.0)	13.2 (12.0–14.3)	21,698	18.2 (16.5–19.9)	12.1 (10.9–13.4)	26,238	18.8 (17.4–20.3)	14.2 (13.0–15.4)
55–64 years	45,053	16.4 (15.1–17.6)	12.8 (11.8–13.8)	21,370	16.1 (14.7–17.4)	12.0 (10.9–13.1)	23,683	16.7 (15.3–18.1)	13.5 (12.3–14.7)
≥70 years	37,032	12.9 (11.8–14.0)	10.3 (9.3–11.3)	18,858	13.9 (12.7–15.1)	11.0 (10.0–12.1)	18,174	12.0 (10.8–13.2)	9.6 (8.4–10.7)
<i>p</i> value for trend		<0.0001	0.0389		<0.0001	<0.0001		<0.0001	0.0007
Residence									
Urban	76,521	28.0 (24.9–31.1)	18.1 (16.3–19.9)	34,686	31.2 (27.5–34.9)	19.5 (17.3–21.7)	41,835	24.7 (22.2–27.2)	16.6 (15.2–18.1)
Rural	111,409	13.8 (12.5–15.1)	8.5 (7.7–9.3)	53,545	15.4 (13.8–17.0)	8.9 (7.9–10.0)	57,864	12.2 (11.0–13.3)	8.0 (7.3–8.8)
<i>p</i> value for difference		<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001
Geographic location									
East	70,133	24.7 (21.6–27.9)	15.8 (14.0–17.6)	32,783	28.1 (24.2–31.9)	17.6 (15.3–19.9)	37,350	21.3 (18.7–23.9)	14.0 (12.5–15.5)
Central	53,214	16.1 (14.3–18.0)	10.2 (9.1–11.4)	25,044	17.9 (15.8–20.0)	10.5 (9.3–11.8)	28,170	14.4 (12.6–16.2)	9.9 (8.7–11.1)
West	64,583	15.7 (14.0–17.4)	9.7 (8.5–10.8)	30,404	16.9 (15.0–18.7)	9.7 (8.4–10.9)	34,179	14.5 (12.8–16.2)	9.7 (8.6–10.8)
<i>p</i> value for difference		<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001
Education									
Primary or less	92,013	9.8 (9.0–10.6)	6.8 (6.2–7.4)	36,634	9.3 (8.5–10.1)	6.0 (5.4–6.5)	55,379	10.2 (9.3–11.1)	7.4 (6.7–8.2)
Junior high	57,434	16.9 (15.4–18.4)	10.6 (9.6–11.6)	31,321	17.2 (15.7–18.6)	10.0 (9.1–10.9)	26,113	16.5 (14.7–18.4)	11.3 (9.8–12.8)
Senior high	24,334	28.7 (25.9–31.4)	18.1 (16.5–19.6)	13,379	31.4 (27.2–35.6)	19.3 (16.6–22.1)	10,955	24.8 (23.0–26.6)	16.3 (15.1–17.4)
College or above	14,149	38.8 (36.4–41.1)	23.4 (21.8–25.1)	6,897	45.4 (42.5–48.3)	27.4 (25.2–29.6)	7,252	31.7 (29.1–34.4)	19.2 (17.4–21.0)
<i>p</i> value for trend		<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001
Household income per capita, CNY									
Q1(<6,667)	40,567	11.7 (10.6–12.8)	7.1 (6.4–7.8)	19,738	12.6 (11.4–13.8)	7.4 (6.5–8.2)	20,829	10.9 (9.4–12.3)	6.8 (5.9–7.6)
Q2(6,667–13,332)	37,494	15.6 (14.4–16.8)	9.1 (8.2–9.9)	17,742	17.0 (15.4–18.5)	9.1 (8.0–10.3)	19,752	14.2 (12.8–15.7)	9.0 (8.0–10.0)
Q3(13,333–27,999)	40,398	20.9 (19.0–22.8)	13.5 (12.2–14.8)	18,750	22.9 (20.4–25.4)	14.1 (12.4–15.8)	21,648	18.8 (17.3–20.3)	12.9 (11.8–14.0)
Q4(28,000+)	37,617	29.1 (26.7–31.5)	19.3 (17.8–20.7)	17,376	33.0 (30.2–35.8)	21.4 (19.4–23.4)	20,241	25.0 (22.9–27.2)	17.0 (15.8–18.2)
Don't know or refused	31,854	17.4 (14.9–19.9)	10.7 (9.2–12.2)	14,625	20.1 (16.8–23.3)	11.4 (9.7–13.2)	17,229	14.8 (12.6–17.0)	10.0 (8.5–11.6)
<i>p</i> value for trend		<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001
Occupation									
Office/shop/other non-manual	27,281	33.7 (31.3–36.0)	20.2 (19.0–21.3)	14,216	37.4 (34.7–40.2)	22.5 (20.9–24.0)	13,065	29.0 (26.9–31.2)	17.3 (16.2–18.5)
Factory and construction manual	24,343	20.8 (17.7–23.8)	12.4 (10.1–14.6)	15,227	22.5 (19.1–26.0)	13.0 (10.3–15.6)	9,116	16.9 (14.3–19.6)	11.1 (9.3–12.9)

TABLE 1. (Continued)

Items	Overall			Men			Women		
	N	Prevalence/% (95% CI)		N	Prevalence/% (95% CI)		N	Prevalence/% (95% CI)	
		LTPA	Regular LTPA		LTPA	Regular LTPA		LTPA	Regular LTPA
Farming related	84,883	10.6 (9.7–11.4)	6.6 (6.1–7.1)	42,288	10.7 (9.8–11.6)	6.1 (5.6–6.5)	42,595	10.4 (9.5–11.4)	7.1 (6.4–7.8)
Retired	17,103	29.8 (27.8–31.8)	25.7 (23.9–27.5)	7,877	29.4 (27.0–31.9)	25.2 (23.0–27.4)	9,226	30.1 (27.9–32.3)	26.2 (24.3–28.1)
Not working	34,320	13.8 (12.5–15.2)	9.3 (8.2–10.4)	8,623	14.8 (12.9–16.8)	9.1 (7.6–10.5)	25,697	13.4 (11.9–15.0)	9.3 (8.1–10.6)
<i>p</i> value for difference		<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001

Abbreviation: LTPA=leisure-time physical activity.

\* Table presented weighted prevalence, which represents the national total population.

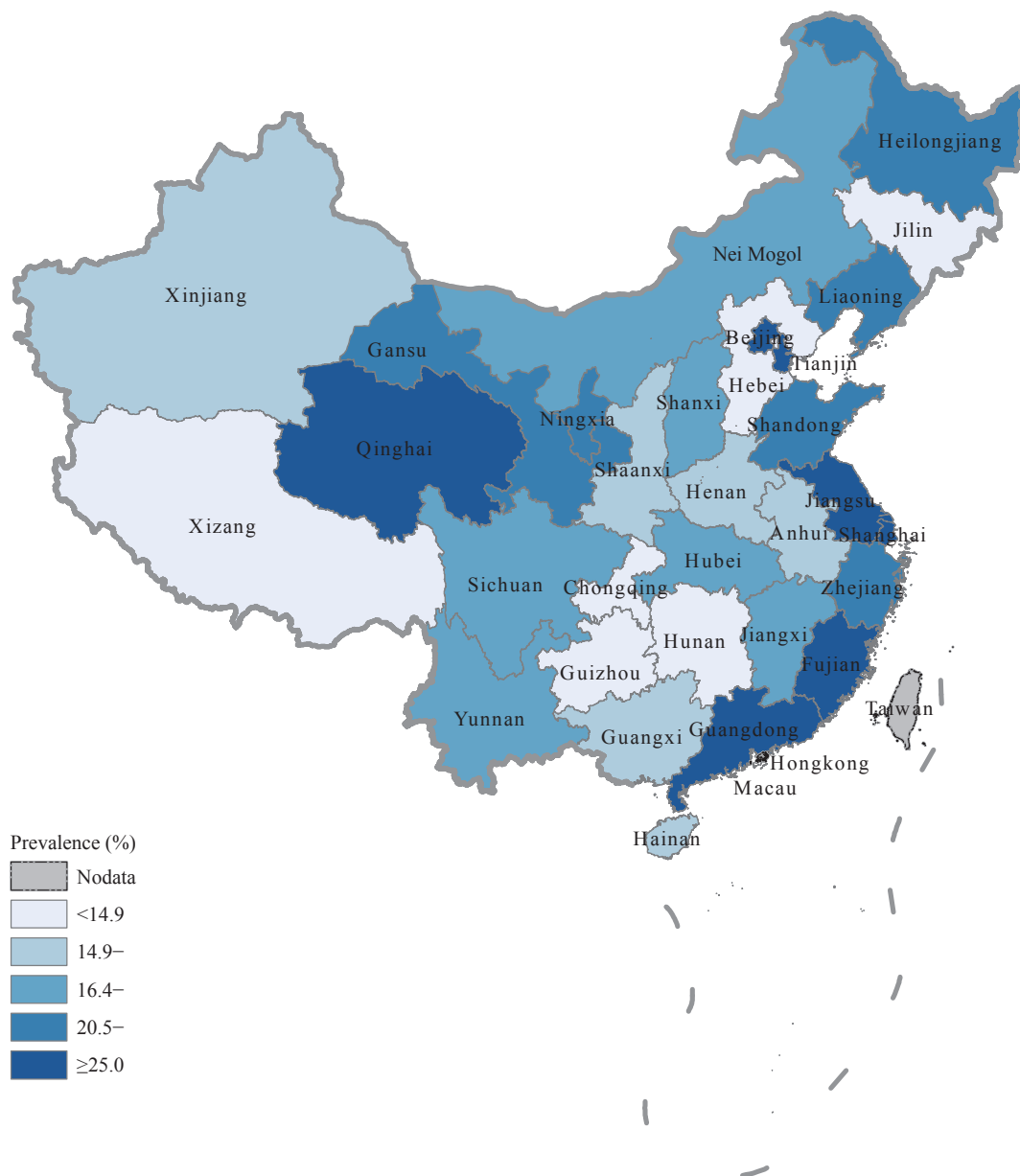


FIGURE 1. Age-standardized prevalence of leisure-time physical activity (LTPA) among adults at the provincial level in China in 2015.



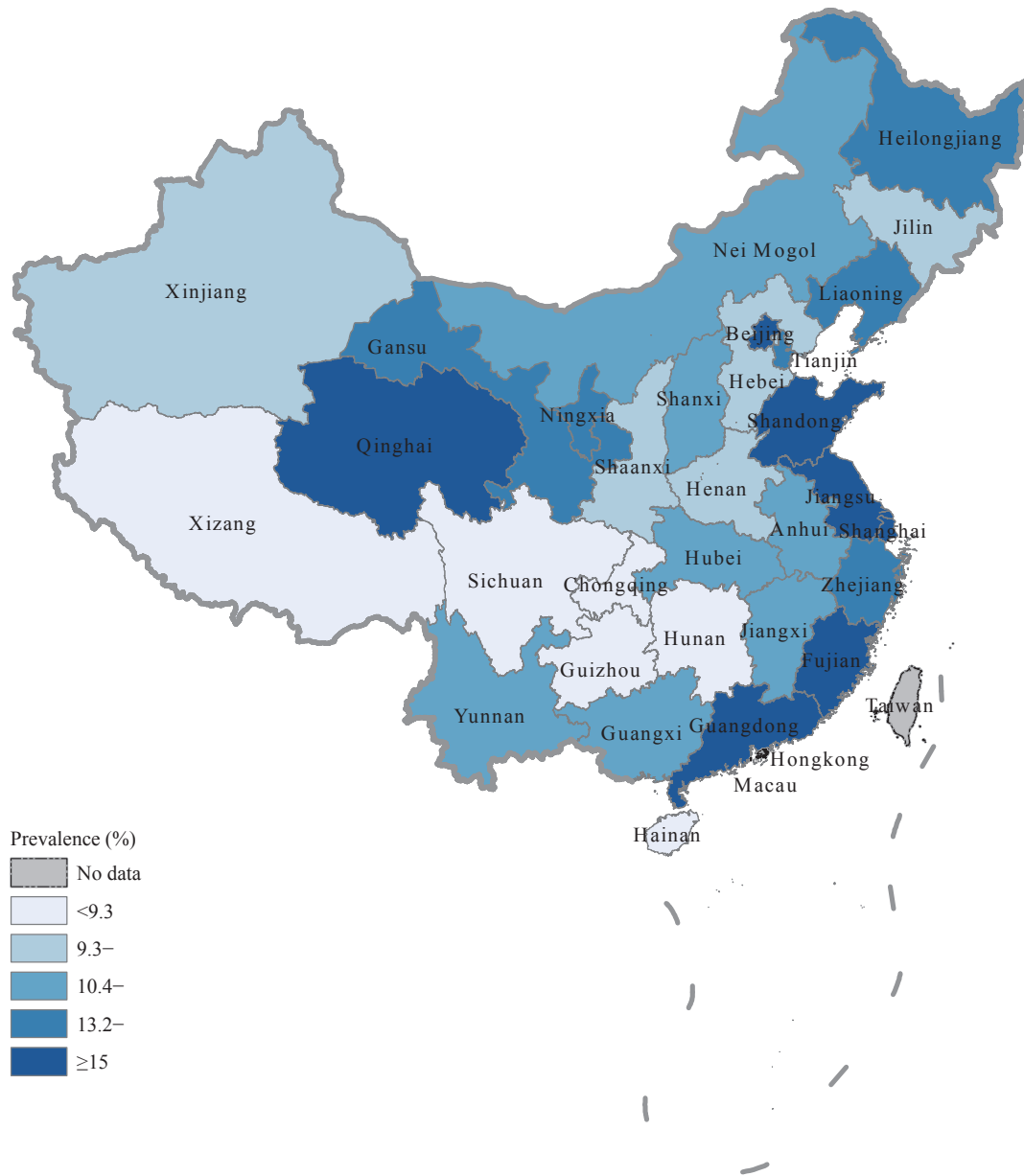


FIGURE 2. Age-standardized prevalence of regular leisure-time physical activity (LTPA) among adults at the provincial level in China in 2015.

than Shanghai, which ranked second. The lowest LTPA among adults in Xizang (Tibet) Autonomous Region was probably due to the high-altitude hypoxic environment.

According to Healthy China 2030 issued by the State Council in 2016, 435 million people (>30% of the whole population) and 530 million people (>40% of the whole population) are expected to do physical exercise regularly by 2020 and 2030, respectively. However, based on our study, with approximately 1.09 billion adults in total in the mainland of China, it was projected that only less than 150 million adults were involved in regular LTPA in 2015. So it seems to be

difficult to reach the goal by 2020. Thus, to achieve the goal in 2030, more effort should be made to promote the implementation of the national fitness program.

This study was subject to at least one limitation. The individual history of physical activity was based on self-reporting. Some participants might have difficulty distinguishing between low-intensity activities and moderate-intensity activities as well as accurately recalling specific amounts of activity. This recall bias and difficulty interpreting the questions might have resulted in a slight overestimation of LTPA in Chinese adults.

In conclusion, this study provides an updated assessment as of 2015 of the largest nationwide and population-based self-reported status of LTPA in China. The prevalence of LTPA and regular LTPA had increased from the past but were still at a low level. To promote more people, especially those with lower socioeconomic status, to participate in LTPA, great effort are required to strengthen national and local policy initiatives, financial support, sports facilities construction, and health education, especially in rural areas and in western China.

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