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# The Toilet Revolution Empowers Rural Revitalization based on a Health Perspective

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## Abstract

**Since the reform and opening up, with the rapid development of the Chinese economy, public health problems have become increasingly serious. At the same time, due to the reality of imbalanced urban-rural development in China, improving the living environment in rural areas is the key and difficult point to achieve rural revitalization. Therefore, in 2015, the Chinese government officially began the "Toilet Revolution", a national public health movement aimed at improving urban and rural public health problems, enhancing people's quality of life, promoting rural economic development, and further promoting the implementation of the rural revitalization strategy. Based on a health perspective, this article analyzes the impact of the "toilet revolution" on rural health human capital by reviewing existing data and literature such as the "China Statistical Yearbook" on the level of health service expenditure and the number of sanitary toilet constructions. It further elucidates the mechanism by which the "toilet revolution" empowers rural revitalization, providing a theoretical basis for the government to deepen the "toilet revolution", narrow the urban-rural gap, and promote rural revitalization.**

## Keywords

**Toilet Revolution; Health Human Capital; Rural Revitalization.**

## 1. Introduction

With the rapid development of China's economy since the reform and opening up, the construction of public facilities in urban and rural areas is facing many challenges, including the issue of public toilets. Especially in rural areas, due to the lagging infrastructure construction, the quantity and quality of public toilets are difficult to meet the growing demand, leading to worrying environmental sanitation conditions and seriously affecting the quality of life of rural residents.

In order to improve this situation, the Chinese government launched the nationwide public health movement "Toilet Revolution" in 2015. This movement aims to improve the hygiene conditions of public toilets, enhance the quality of life of rural residents, and promote the development of rural economy and society. However, despite the significant achievements of the "toilet revolution", there are still some problems and shortcomings, such as uneven investment levels in toilet renovation and low penetration rates of sanitary toilets.

In response to these issues, the Central Committee of the Communist Party of China and the State Council issued and implemented the "Healthy China 2030" planning outline in 2016. This is the first time that China has proposed a medium - to long-term strategic plan in the field of health at the national level. The 20th National Congress of the Communist Party of China emphasized the need to promote the construction of a healthy China, prioritize the protection of people's health, and improve policies to promote people's health. Building a good living

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environment is the most direct factor affecting the quality of life and health of the vast majority of residents. Therefore, improving the living environment in urban and rural areas is listed as an important content in both the report of the 20th National Congress of the Communist Party of China and the "Healthy China 2030" planning outline. At the same time, due to the reality of imbalanced urban-rural development in China, improving the living environment in rural areas is a key and difficult point. Therefore, how to promote the further development of the "toilet revolution", improve the level of rural living environment, and achieve further improvement of healthy human capital has become an important measure to achieve the Healthy China strategy and a key task to promote rural revitalization strategy.

At the same time, this project also examines the government's policy choices in the "toilet revolution", providing theoretical basis and policy recommendations for further elucidating how the "toilet revolution" empowers rural revitalization.

## 2. Literature Review

At present, domestic scholars generally believe that improving rural living environment and increasing healthy human capital play an important role in rural revitalization. Wang Qi et al. (2024) studied the impact and mechanism of health infrastructure construction on individual health levels, and demonstrated that the process of sanitary toilet renovation significantly improved individuals' self-rated health levels. Dong Jie et al. (2022) used rural micro samples from the 2014 China Education Tracking Survey data to explore the relationship between the "toilet revolution" and the health of rural minors: micro evidence and its mechanism. The study showed that having independent toilets in rural areas significantly improves the health level of minors aged 12-16. Liang Chao et al. (2023) studied the impact of rural toilet renovation on residents' health and medical expenses, and constructed a double difference model using the differences in toilet renovation time. The study found that rural toilet renovation significantly reduced residents' daily disease rates, medical needs, and medical expenses. At the same time, through cost-benefit analysis, it revealed that rural toilet renovation has enormous economic and social value. Yu Fawen (2019) elaborated on the contemporary value of improving the living environment in rural areas. Improving the living environment and building beautiful and livable villages is an important task in implementing the rural revitalization strategy. Ren Xin et al. (2023) analyzed the many practical problems currently faced by rural toilet renovation, emphasizing that the government should mobilize the enthusiasm of farmers to renovate toilets, increase investment in toilet renovation funds, and improve relevant systems, which have important practical significance for achieving rural ecological revitalization. Liu Chuanming et al. (2020) studied the impact of rural toilet renovation on farmers' healthcare expenditure based on provincial panel data from 2010 to 2017 in China. The research results showed that rural toilet reform significantly reduced farmers' healthcare expenditure. Deng Liyuan et al. (2018) conducted an empirical study on the impact of healthy human capital on non-agricultural employment income among rural residents in China. The study showed that healthy human capital has significant gender differences in non-agricultural employment and income among rural residents, with a more significant positive impact on non-agricultural employment and income among male rural residents. Yu Jingwen et al. (2019) studied the relationship between healthy human capital and regional economic growth in China. The research shows that the improvement of healthy human capital can not only alleviate the negative impact of the absolute decline in factor resources, but also promote regional economic growth in China. Li Jie et al. (2020) provided a detailed and comprehensive introduction on how to accelerate the "toilet revolution" in rural China, highlighting the difficulties faced in its further development. They also proposed a series of solutions, providing theoretical basis and policy recommendations for accelerating the construction of "beautiful and livable rural areas"

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in the new era. Yao Fucheng (2023) discusses the current situation and development strategies of the toilet revolution in the context of rural revitalization. Based on a comprehensive review of existing literature, this paper explores countermeasures and suggestions for promoting China's toilet revolution from the perspectives of hygiene and health awareness, popularization of sanitary toilets, tourism toilet renovation, and toilet manure treatment.

## 3. Changes in the Number of Sanitary Toilets in Various Provinces of China

Table 1 shows the trend of changes in the number of public toilets in various provinces of China from 2015 to 2022. The data includes two indicators: the total number of public toilets (seats) and the number of public toilets of three or more categories. From the overall data, it can be seen that the number of public toilets in China is generally on the rise. From 2015 to 2022, the number of public toilets in China increased from 126344 to 193654, an increase of 53.3%. During the same period, the number of public toilets of category three or above also showed an upward trend, increasing from 93541 to 167975, an increase of 79.8%. In 2022, Guangdong Province had the highest number of public toilets, reaching 13515, of which 12927 were classified as Class III or above. This indicates that in recent years, the Chinese government and various sectors of society have attached increasing importance to the construction of public toilets, and the proportion of public toilets with three or more standards in the total number has gradually increased. It also shows that the quality and standards of public toilets in China are constantly improving. However, there are differences in the growth rate of the number of public toilets in different regions. For example, the number of public toilets in economically developed regions such as Guangdong, Jiangsu and Shandong is growing rapidly, while the growth in western regions such as Xizang and Qinghai is relatively slow. This is related to factors such as the level of economic development, population density, and level of tourism development in various regions.

**Table 1.** Number of Public Restrooms by Region in China from 2015 to 2022 (Unit: Seat)

| Year / Region | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|
| | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above |
| All of China | 126344 | 93541 | 129818 | 97640 | 136084 | 104264 | 147466 | 117986 |
| Beijing | 5401 | 5401 | 5398 | 5352 | 5275 | 5228 | 5270 | 5250 |
| Tianjin | 1327 | 846 | 1358 | 567 | 1475 | 809 | 1384 | 926 |
| Hebei | 6298 | 3389 | 5546 | 2978 | 5450 | 3242 | 6044 | 3996 |
| Shanxi | 3261 | 1715 | 3550 | 1784 | 2380 | 1839 | 2459 | 1805 |
| Inner Mongolia | 4171 | 1827 | 4163 | 1935 | 6448 | 2636 | 7612 | 4471 |
| Liaoning | 5056 | 1839 | 5393 | 2004 | 4172 | 1933 | 4138 | 2325 |
| Jilin | 3643 | 1168 | 3586 | 1357 | 3417 | 1624 | 3828 | 2617 |
| Heilongjiang | 6617 | 2668 | 6133 | 2532 | 5719 | 2061 | 5788 | 2310 |
| Shanghai | 6197 | 2618 | 6220 | 2641 | 6221 | 2642 | 6061 | 3456 |
| Jiangsu | 11739 | 10004 | 12136 | 10637 | 12934 | 11413 | 13965 | 12929 |
| Zhejiang | 8199 | 6923 | 8145 | 7045 | 7883 | 6752 | 8075 | 6520 |
| Anhui | 3223 | 2813 | 3417 | 3040 | 3467 | 2972 | 3826 | 3236 |
| Fujian | 3185 | 3156 | 2629 | 2602 | 3924 | 2789 | 4824 | 3407 |
| Jiangxi | 1887 | 1509 | 2077 | 1735 | 2242 | 1837 | 2581 | 2149 |
| Shandong | 6351 | 5505 | 6860 | 5997 | 6547 | 6070 | 7086 | 6673 |
| Henan | 7540 | 7040 | 7932 | 7427 | 8593 | 8055 | 9851 | 9405 |
| Hubei | 5475 | 3974 | 5451 | 4378 | 5173 | 4569 | 5596 | 4933 |
| Hunan | 3371 | 2682 | 3573 | 2288 | 3576 | 2198 | 4331 | 2739 |
| Guangdong | 9769 | 9309 | 10634 | 10063 | 10582 | 9605 | 10812 | 10304 |
| Guangxi | 1496 | 1370 | 1503 | 1175 | 1552 | 1376 | 1645 | 1464 |
| Hainan | 457 | 441 | 715 | 629 | 697 | 617 | 986 | 766 |

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|---|---|---|---|---|---|---|---|---|
| Chongqing | 3208 | 2354 | 3530 | 2876 | 4115 | 2917 | 4242 | 3045 |
| Sichuan | 4383 | 3209 | 4974 | 3741 | 5893 | 4565 | 6116 | 4974 |
| Gujian | 1440 | 1187 | 1361 | 1108 | 2109 | 2003 | 2240 | 2154 |
| Yunnan | 2619 | 2330 | 3240 | 2911 | 5091 | 4888 | 6158 | 5858 |
| Tibet | 317 | 160 | 317 | 160 | 360 | 40 | 436 | 61 |
| Shaanxi | 4266 | 4161 | 4427 | 4330 | 5350 | 4997 | 6323 | 6078 |
| Gansu | 1518 | 1202 | 1664 | 1359 | 1694 | 1479 | 1999 | 1706 |
| Qinghai | 691 | 327 | 698 | 441 | 698 | 654 | 712 | 163 |
| Ningxia | 746 | 657 | 747 | 693 | 759 | 692 | 786 | 736 |
| Xinjiang | 2493 | 1757 | 2441 | 1855 | 2288 | 1762 | 2292 | 1530 |
| Year / Region | 2019 | | 2020 | | 2021 | | 2022 | |
| | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above | Number of public restrooms | Classifications of Level Three or Above |
| All of China | 153426 | 128602 | 165186 | 141279 | 184063 | 158111 | 193654 | 167975 |
| Beijing | 6034 | 6026 | 6177 | 6177 | 6343 | 6343 | 6435 | 6435 |
| Tianjin | 1510 | 1277 | 4269 | 3810 | 4348 | 4006 | 4563 | 4253 |
| Hebei | 5884 | 4401 | 6611 | 5383 | 7429 | 6745 | 8252 | 7697 |
| Shanxi | 2634 | 2096 | 3015 | 2057 | 4197 | 3123 | 4430 | 3336 |
| Inner Mongolia | 7233 | 4577 | 7237 | 5050 | 6853 | 5209 | 6956 | 5257 |
| Liaoning | 4710 | 2714 | 4664 | 3281 | 5423 | 3882 | 5743 | 4150 |
| Jilin | 4427 | 3370 | 4319 | 3507 | 4724 | 3705 | 4813 | 3681 |
| Heilongjiang | 5964 | 2982 | 6048 | 3397 | 5997 | 3423 | 5994 | 3442 |
| Shanghai | 6225 | 4260 | 5676 | 3799 | 6289 | 3957 | 6253 | 3952 |
| Jiangsu | 14279 | 13317 | 14961 | 13729 | 15284 | 14210 | 14627 | 13766 |
| Zhejiang | 7744 | 6413 | 8631 | 7595 | 9636 | 8468 | 10201 | 9220 |
| Anhui | 4403 | 4021 | 4769 | 4387 | 6685 | 5787 | 7092 | 6937 |
| Fujian | 5517 | 4627 | 6344 | 5022 | 6885 | 5566 | 6928 | 5590 |
| Jiangxi | 3756 | 3265 | 4331 | 4028 | 5435 | 4866 | 6049 | 6048 |
| Shandong | 7458 | 6896 | 8028 | 7470 | 9104 | 8549 | 10829 | 10151 |
| Henan | 10675 | 10089 | 10890 | 10279 | 12273 | 11781 | 12684 | 12247 |
| Hubei | 5828 | 5149 | 6197 | 5588 | 6447 | 5732 | 7889 | 6552 |
| Hunan | 4022 | 3001 | 4380 | 3205 | 5018 | 3769 | 5168 | 3874 |
| Guangdong | 11497 | 10970 | 12288 | 11788 | 13585 | 13064 | 13515 | 12927 |
| Guangxi | 1784 | 1694 | 1934 | 1772 | 1987 | 1854 | 3039 | 1863 |
| Hainan | 1048 | 977 | 1296 | 1247 | 934 | 925 | 1475 | 1466 |
| Chongqing | 4606 | 3536 | 4801 | 3729 | 4917 | 3869 | 4991 | 3936 |
| Sichuan | 6627 | 5381 | 7527 | 6421 | 9603 | 8059 | 9786 | 8377 |
| Gujian | 2275 | 2177 | 2445 | 2328 | 3968 | 3227 | 4324 | 3635 |
| Yunnan | 4610 | 4466 | 5155 | 4968 | 5860 | 5713 | 6495 | 6311 |
| Tibet | 670 | 127 | 778 | 156 | 875 | 158 | 897 | 101 |
| Shaanxi | 6129 | 5909 | 6286 | 6019 | 6475 | 6183 | 6689 | 6459 |
| Gansu | 1964 | 1727 | 2115 | 1849 | 2986 | 2326 | 3092 | 2688 |
| Qinghai | 751 | 699 | 741 | 652 | 774 | 661 | 834 | 716 |
| Ningxia | 869 | 834 | 898 | 873 | 948 | 885 | 905 | 842 |
| Xinjiang | 2293 | 1624 | 2375 | 1713 | 2781 | 2066 | 2706 | 2066 |

## 4. Health Service Expenditure in China

According to Table 2, from 2015 to 2022, China's total health expenditure has continued to grow, increasing from 4097464 billion yuan in 2015 to 85327449 billion yuan in 2022, with an average annual growth rate of about 10%. And the proportion of social health expenditure in the total health expenditure continues to rise, from 40.29% in 2015 to 44.94% in 2022. This indicates that the role of social forces in the supply of health services is becoming increasingly important. In addition, the proportion of personal health expenditure in the total health expenditure has shown a downward trend, from 29.27% in 2015 to 26.89% in 2022. This may be related to the government increasing its efforts in medical security and reducing individual medical burdens. At the same time, the ratio of total health expenditure to GDP has increased

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from 5.95% in 2015 to 7.05% in 2022, indicating that the proportion of medical investment in the economy continues to rise. This reflects the increasing importance that the country places on the healthcare industry, as well as the growing importance that residents place on their health.

**Table 2.** Healthcare Expenditure and its Proportion

| Year | Total Expenditure on Health (Billion) | The proportion of total government health expenditure to total health expenditure | The proportion of social health expenditure in total health expenditure | The proportion of out-of-pocket health expenditure in total health expenditure | Health expenditure as a percentage of GDP(%) |
|---|---|---|---|---|---|
| 2015 | 40974.64 | 30.45 | 40.29 | 29.27 | 5.95 |
| 2016 | 46344.88 | 30.01 | 41.21 | 28.78 | 6.21 |
| 2017 | 52598.28 | 28.91 | 42.32 | 28.77 | 6.32 |
| 2018 | 59121.91 | 27.74 | 43.66 | 28.61 | 6.43 |
| 2019 | 65841.39 | 27.36 | 44.27 | 28.36 | 6.67 |
| 2020 | 72175.00 | 30.4 | 41.94 | 27.65 | 7.10 |
| 2021 | 76844.99 | 26.91 | 45.50 | 27.60 | 6.69 |
| 2022 | 85327.49 | 28.17 | 44.94 | 26.89 | 7.05 |

## 5. Infant and Child Mortality Rates in Rural Areas, as Well as Mortality Rates and Causes of Death from Major Diseases among Rural Residents

Toilets, as a typical representative of environmental sanitation facilities, are an important indicator of civilization. Studies by scholars Afolabi et al. (2017) and Skambraks et al. (2017) have shown that in developing countries and regions, including China, toilet waste (liquid) pollution is the main culprit causing infectious diseases among minors. Fogel's (1994) study suggests that minors are the driving force for the future development of a country, and their health status directly affects the level of human health capital in the future. Ensuring the health of this group is of great practical significance for sustained economic growth in the future. Dong Jie et al. (2022) explored in their article "Toilet Revolution" and Rural Minors' Health: Micro evidence and Mechanism of Action "that there is an important relationship between the" toilet revolution "and the health of rural minors, especially for infants and young children. As the first important stage of human growth and development, infants and young children have higher requirements for hygiene conditions. Coswosk et al. (2019) and Tegegne et al. (2014) found that poor toilet hygiene is more likely to lead to immune, digestive, and reproductive system related diseases. According to the China Statistical Yearbook, the neonatal and infant mortality rates from 2015 to 2022 have shown a decreasing trend in rural areas since 2015. The neonatal mortality rate in rural areas decreased from 6.4 ‰ in 2015 to 3.6 ‰ in 2022, and the infant mortality rate in rural areas decreased from 9.6 ‰ in 2015 to 5.7 ‰ in 2022. According to the analysis of the mortality rates and causes of death of major diseases among rural residents, there has been a continuous downward trend in the mortality rates of infectious diseases and respiratory diseases among rural residents from 2015 to 2021. The mortality rate of infectious diseases among rural residents decreased from 7.72 (1/100000) in 2015 to 6.52 (1/100000) in 2021, and the mortality rate of respiratory diseases among rural residents decreased from 79.96 (1/100000) in 2015 to 65.23 (1/100000) in 2021. As early as the 1990s, the Chinese government officially included rural toilet renovation work in the national development plan, and a "toilet revolution" movement aimed at improving the hygiene of rural toilets was launched. There is a close relationship between the reduction of rural diseases and toilet reform.

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The government's continuous improvement of rural hygiene conditions, especially the toilet revolution, is one of the important measures to improve the health level of rural residents. Firstly, traditional rural toilets are often rudimentary dry toilets with poor hygiene conditions, which can easily breed mosquitoes and flies and spread diseases. Through toilet reform and promotion of sanitary toilets, the hygiene habits of rural residents can be effectively improved and disease transmission can be reduced; Secondly, the design of sanitary toilets can effectively isolate human excrement, reduce the risk of pathogen transmission through soil and water sources, and thus lower the mortality rate of intestinal infectious diseases and respiratory diseases.

**Table 3.** Monitor the neonatal and infant mortality rates in the region

| Year | Neonatal mortality rate(‰) | | | infant(‰) | | |
|---|---|---|---|---|---|---|
| | Total | City | Countryside | Total | City | Countryside |
| 2015 | 5.4 | 3.3 | 6.4 | 8.1 | 4.7 | 9.6 |
| 2016 | 4.9 | 2.9 | 5.7 | 7.5 | 4.2 | 9 |
| 2017 | 4.5 | 2.6 | 5.3 | 6.8 | 4.1 | 7.9 |
| 2018 | 3.9 | 2.2 | 4.7 | 6.1 | 3.6 | 7.3 |
| 2019 | 3.5 | 2.0 | 4.1 | 5.6 | 3.4 | 6.6 |
| 2020 | 3.4 | 2.1 | 3.9 | 5.4 | 3.6 | 6.2 |
| 2021 | 3.1 | 1.9 | 3.6 | 5.0 | 3.2 | 5.8 |
| 2022 | 3.1 | 1.8 | 3.6 | 4.9 | 3.1 | 5.7 |

**Table 4.** Mortality Rate of Infectious Diseases and Respiratory System Diseases among Rural Residents from 2015 to 2021(unit: 1/10ten thousand)

| Disease name | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| Infectious disease(TB) | 7.72 | 7.76 | 7.43 | 7.26 | 6.94 | 6.61 | 6.52 |
| Respiratory diseases | 79.96 | 81.72 | 78.57 | 77.67 | 74.61 | 63.64 | 65.23 |

# 6. Conclusion and Suggestions

## 6.1. Conclusion

The renovation of rural toilets can help improve the living environment in rural areas, enhance the level of healthy human capital, and is a key task of the rural revitalization strategy. Rural revitalization is a necessary path to narrowing the urban-rural gap and achieving common prosperity. This article reviews and analyzes existing data and literature such as the China Statistical Yearbook. Starting from three aspects: the number of sanitary toilets, health service expenditures, infant and child mortality rates in rural areas, and the main disease mortality rates and causes of death among rural residents, the analysis shows that although there are differences in the number of sanitary toilets in various regions of China from 2015 to 2022, the quantity has shown an upward trend; The total health expenditure in China continues to grow, and its proportion to GDP continues to increase; The infant and child mortality rates in rural areas are continuously decreasing, while the mortality rates of major diseases and causes of death related to infectious diseases and respiratory diseases among rural residents are also decreasing. At the same time, because it is difficult to accurately measure health human capital, Qi Yu et al. (2015) used indicators such as mortality and incidence rate to measure health human capital in a relatively macro study, taking into account the availability of data. Therefore, in the process of the "toilet revolution", the increase in the number of sanitary toilets and healthcare service expenditures has to some extent improved the level of health human capital.

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In summary, the study by Yu Jingwen et al. (2019) on the relationship between healthy human capital and regional economic growth in China shows that the improvement of healthy human capital can not only alleviate the negative impact of the absolute decline in factor resources, but also promote regional economic growth in China. Therefore, in the process of the "toilet revolution", the improvement of the living environment, the increase in the number of sanitary toilets, and the increase in health service expenditures have improved the level of health human capital in rural areas, thereby helping to promote economic growth in rural areas, narrow the urban-rural gap, empower rural revitalization, and achieve common prosperity.

## 6.2. Suggestions

(1) Increase capital investment and optimize resource allocation. Given the differences in the growth rate of public toilets in different regions, it is recommended that the government continue to increase financial investment in the "toilet revolution", especially in economically underdeveloped areas and rural areas in the central and western regions. By establishing a special fund, optimizing resource allocation, and ensuring that funds can be accurately invested in the areas where they are most needed, the quantity and quality of public toilets in these areas can be improved.

(2) Promote standardized construction and improve toilet quality. From the data, it can be seen that the number of public toilets with three or more categories has increased significantly, but the proportion is relatively low. Therefore, standardization construction should be further promoted to improve the overall quality of public toilets. The government should establish stricter standards for the construction of public toilets and strengthen supervision and inspection to ensure that newly built and renovated toilets meet the standards and improve the satisfaction of the people.

(3) Strengthen policy guidance and stimulate social participation. The government should further strengthen policy guidance and stimulate the enthusiasm of enterprises and individuals to participate in the "toilet revolution" through measures such as tax reductions, subsidies, and rewards. At the same time, social capital can be introduced and models such as PPP (public-private partnership) can be adopted to jointly promote the construction and management of public toilets.

(4) Strengthen publicity and education to enhance public health awareness. The deepening of the 'toilet revolution' requires the support and participation of the entire public. Therefore, the government should strengthen publicity and education, enhance public health awareness, and guide everyone to develop good hygiene habits. Through media promotion, community activities, and other means, popularize toilet hygiene knowledge and raise public awareness of the importance of the "toilet revolution".

(5) Improve post management to ensure the long-term operation of toilets. The construction of public toilets is only the first step, and later management is equally important. The government should establish a sound management mechanism for public toilets, clarify the responsible parties, and ensure that the daily cleaning, maintenance, and upkeep of toilets are effectively implemented. At the same time, third-party evaluation agencies can be introduced to conduct regular assessments of the operation of public toilets, promptly identify problems, and rectify them.

(6) Emphasize technological innovation and promote intelligent development. With the development of technology, intelligent public toilets have become a trend. The government should encourage and support technological innovation to promote the intelligent development of public toilets. For example, introduce technologies such as intelligent monitoring, automatic cleaning, and water and energy conservation can improve the efficiency and comfort of public toilets. At the same time, through big data analysis, optimize the layout and resource allocation of public toilets, and improve the service level of public toilets.

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