

Perspectives

Enhancing Public Health Competencies via Action on Salt China — China, 2017–2022

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The Action on Salt China (ASC) project is a noteworthy collaborative venture between China and UK, with the China CDC serving as a key partner. The objective of this report is to present a case study that demonstrates the significant role of ASC in bolstering the capacity of public health services in China. Furthermore, this study aims to offer valuable references and provoke thoughtful insight for potential international collaborations in the future.

Obstacles Encountered in the Execution of Salt Reduction Strategies

In China, the consumption of salt significantly exceeds the World Health Organization's (WHO) recommended limits, with intake levels twice as high. Prevailing evidence has underscored salt reduction as one of the most economical and practical preventative measures to stave off hypertension and cardiovascular diseases. In recent decades, certain nations such as the UK have successfully created and instituted nationwide salt reduction programs. In China, where consumers add approximately 80% of the salt during meal preparation, considerable strides have been made towards crafting salt reduction strategies and interventions under the umbrella of Healthy China 2030 Actions. However, several obstacles obstruct the comprehensive application of these strategies. One notable hurdle is the inadequate capability of the public health workforce to craft, enforce, and assess intricate interventions aimed at promoting salt reduction across varied settings. This includes a deficiency in necessary competencies and expertise to devise scalable and practical salt-reduction intervention initiatives based on need analysis. Furthermore, there's a crucial necessity for the capacity to effectively execute the package, bolstered by ongoing process evaluations, as well as assessments of effectiveness and health economics. As such, offering continuous education and training for public health workers is critical for them to effectively perform their roles in preventing and controlling noncommunicable diseases.

Opportunities Provided by ASC

ASC is a global health research unit jointly spearheaded by Professor Graham MacGregor and Feng J He of Queen Mary University of London (QMUL) and Professor Puhong Zhang of the George Institute for Global Health, China (TGI China) (1). Being funded by the National Institute for Health and Care Research (NIHR) in the UK, ASC has aimed at addressing the public health challenge of excessive salt consumption through a spectrum of capacity building initiatives since its inception in 2017.

ASC was overseen by a senior steering committee, presided over by Professor Longde Wang, a member of the Chinese Academy of Engineering and the former Vice Minister of Health. In addition to the principal research institutes of TGI China and QMUL, ASC collaborates with partners such as the China CDC, the Chinese Center for Health Education, the China National Center for Food Safety Risk Assessment, and Beihang University. Further support is provided by regional collaborators in the provinces of Hebei, Heilongjiang, Jiangxi, Hunan, Sichuan, and Qinghai, as well as local partners located in 33 study sites at county and district levels.

ASC convened a multidisciplinary team of researchers with substantial expertise in various public health fields including salt reduction, trial design, community engagement, intervention development, mobile health, project management, data management and analysis, process evaluation, health economic evaluation, and implementation science. Equally important fields covered by the team include health education, communication, policy advocacy, and financial management. These specializations are crucial in building the competencies and skillset required for the successful implementation of effective salt reduction interventions.

Efforts to mitigate copious salt consumption in China, which primarily originates from home/restaurants cooking and pre-packaged food, incorporated six distinct strategies within the ASC (2).

These strategies encompassed four cluster randomized controlled trials (RCTs): an application-based intervention study directed at schoolchildren and their families (AIS) (3); a home cook-centric intervention study (HIS) (4); a restaurant-based intervention study (RIS) (5–6), and a comprehensive intervention study (CIS) (7). Two national health campaigns were also included: an educational campaign raising awareness about salt consumption (8) and a campaign encouraging salt reduction in processed foods, buttressed by research on food sodium content to aid target setting and nutrition labeling (9–10). A comprehensive salt reduction intervention package, successfully proven by the aforementioned RCTs, was notably amplified across all six provinces in 2020–2021.

The Endeavors of ASC in the Realm of Capacity Building

The development of capacity remains a fundamental element of the ASC program, dating back to its RCT phase from 2018 to 2019, and continuing through to its expansion phase from 2020 to 2021. A few notable outcomes of the ASC's capacity-building initiatives are outlined as follows:

The four RCTs conducted encompassed numerous stages including trial design, intervention development, implementation, monitoring, and evaluation. As part of this process, extensive professional training was carried out for public health workers stationed at local CDCs. These trainings, which primarily benefited the CDC staff located at the 33 study sites across six provinces, encompassed a comprehensive range of topics. This included salt reduction knowledge and practical skills, nuances of RCT implementation and evaluation, project management essentials, and quality control methods among other topics. The public health workforce also received training in the use of mHealth-based intervention and evaluation tools, equipping them to carry out the RCTs effectively.

A comprehensive intervention package, designed as a principal educational tool for professional trainings, has been developed. This intervention package includes an all-encompassing array of health education materials such as technical manuals, visual aids, digital and conventional training courses, as well as app-based intervention and evaluation instruments. This package has been incorporated into the national resource repositories of the China CDC and CCHE, and is utilized as instructional material for public health

professionals nationwide (11).

Training sessions on measuring dietary salt intake, utilizing the high-accuracy method of 24-hour urinary sodium excretion, have been implemented in field research. The three RCTs namely AIS, HIS, and CIS, have amassed 24-hour urine samples from a total of 6,030 participants (12). This cohort included 5,436 adults and 594 schoolchildren, consequently making them the most substantial RCTs in China to employ 24-hour urinary sodium in assessing the efficacy of salt reduction interventions. Furthermore, training concerning process evaluation has been executed in these four RCTs.

In the scale-up phase, an ASC Scale-up platform was established to facilitate routine public health operations. This platform includes features such as an activity planning and design module, an extensive repository of educational materials, an activity recording module, an impact evaluation system, and a performance-based incentives module. These capabilities were leveraged across six provinces. By the end of 2021, over 1,000 salt reduction initiatives were executed, with 350 of these activities gaining recognition for their excellence across these provinces (13).

In the broader context of capacity enhancement, numerous engagement initiatives have taken place with multi-sectoral government leaders and policymakers, particularly within the education and health sectors, to facilitate the implementation of salt reduction interventions across various sectors at a policy level. These initiatives have been instrumental in disseminating research findings and advocating for the integration of salt reduction policies into the operations of non-health sectors.

Training workshops have been conducted targeting a variety of stakeholders, including schoolteachers, restaurant chefs, community workers, and members of the media. These individuals play an instrumental role in assisting public health professionals in the implementation of salt reduction interventions in key environments such as schools and restaurants. For instance, within the context of the AIS, training was initially provided to schoolteachers regarding the delivery of interventions, followed up by educational courses for students and salt reduction activities engaging entire families. Likewise, in the RIS, restaurant personnel, such as waiters and chefs, received training on salt reduction knowledge and techniques (13).

Partners of ASC have collaboratively developed a

cloud-based information system. A variety of WeChat applications, including AppSalt, KnowSalt, FoodSwitch, and the Salt and Health WeChat official account, as well as a mobile phone-based data collection system, have been integrated into this system. These digital resources facilitate capacity building activities, health education, intervention implementation, and project management.

Research training opportunities have been given to public health investigators and researchers in order to enhance their capacities in areas such as data management, analysis, process evaluation, implementation science, and health economic evaluation. Throughout the project timeline, research conducted by ASC has facilitated the academic completion of two doctoral and four master's students.

A series of training activities in finance and project management have been implemented for local CDC staff to enhance their competencies. The focus of these activities includes project planning, budget control, due diligence checks, among other related subjects.

Capacity Strengthening Achievements

The public health workforce associated with ASC program has experienced significant benefits, underscored by several exceptional achievements in capacity strengthening, as detailed below:

The competencies and skills necessary for the creation, implementation, and evaluation of population-based salt reduction interventions have seen significant improvements. The CDC staff who participated in this study have acquired in-depth knowledge and practical experience in conducting RCTs and overseeing salt reduction interventions across a variety of environments. Furthermore, collaboration and communication skills with members from non-health sectors, such as educators, have been enhanced to effectively facilitate public health interventions.

The public health workforce has enhanced its abilities regarding the utilization of mHealth innovations, which bolster the implementation of salt reduction interventions. A noteworthy illustration of this is the employment of the AppSalt platform in healthcare education; it has been deemed effective, feasible, and innovative in ensuring a sustainable decrease in salt consumption among both children and adults (3). This application served as the foundation for the EduSaltS project — a salt reduction scaling-up program initiated in over 300 schools in China (14).

The research capabilities within the realm of public

health have seen substantial enhancements. Researchers and investigators from ASC have successfully published more than 60 scholarly articles in high-impact journals including two BMJ articles for the main results of AIS and HIS (3). These publications' critical findings hold substantial implications for policies, procedures, and further research both in China and globally.

Community engagement, advocacy, and social mobilization capacities have been considerably enhanced. For example, the World Hypertension League organized children's art competitions in which numerous schoolchildren participated to commemorate World Hypertension Day from 2020 to 2022. Throughout the duration of the project, consumer awareness campaigns were carried out, encompassing annual events such as World Salt Awareness Week and China's Salt Awareness Week, among other significant campaign days (13).

The capacity for evidence-based policymaking has been significantly enhanced. The ASC program has effectively prepared public health professionals with evidence, enabling them to advocate and lobby for improvements in policies concerning salt reduction. In 2023, the *Chinese Journal of Preventative Medicine* published a crucial policy document titled "Deepening the Action on Salt China — CHRPS Strategies" (15). Another influential paper, proposing maximum sodium targets for pre-packaged foods in China was published in the *Bulletin of the World Health Organization* (16). Furthermore, ASC has been instrumental in advocating for revisions to the nutritional labeling standards for pre-packaged and restaurant foods.

Global Health Impact

The findings of ASC have received extensive international dissemination, notably through platforms including WASSH. The school-based salt reduction model proposed by ASC has been acknowledged as a best practice by the Global Alliance for Chronic Diseases (GACD). This recognition culminated in 2021 with a feature within a series of short films produced by BBC Story Works.

Sustainability

The accomplishments and broad network of ASC have catalyzed the inception of several novel research initiatives, including projects like "School-based Education Program to Reduce Salt: Scaling-Up in China (EduSaltS)" (14), and "Comprehensive

Workplace Intervention for Cancer Prevention in China (WECAN)” (17). Looking ahead, ASC is committed to sustaining its influence and continuing to contribute significantly towards the achievement of the United Nations Sustainable Development Goals.

Limitations

ASC initiative is presently conducted only in selected regions across six provinces in China. While its technical guidance, training materials, salt reduction instruments, expansion platform, and publications may reach a broader spectrum of staff and areas within China, its current impact remains quite constrained. Consequently, additional efforts should be exerted to amplify its influence within the realm of public health.

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