

### Appendix 3 Subnational case studies

#### Box 1 Case study on the management of drug supply shortages

At provincial level, multiple government departments are engaged to coordinate the supply management of drugs listed on the national and provincial shortage lists. By tracking the transaction records on the provincial drug procurement platforms and reports from sentinel hospitals, multi-sectoral meetings are regularly held to discuss the causes for the shortages of drugs and potential solutions to recover the supply. Provincial government can voluntarily report the unaddressed shortages to central government.

In Chongqing Municipality, multiple mechanisms covering stock, supply, pricing, and procurement have been established to address the undersupply of drugs. Chongqing Pharmaceutical Exchange as a procurement platform recording purchasing transactions of drugs, along with the hospital medicine inventory, constitutes the main body of the shortage tracker. The Drug Administration Department of the Municipal Health Commission monitors the use of shortage medicines in healthcare facilities. The undersupplies or shortage of drugs reported by news media are also collected to track shortage. Municipal Commission of Economy and Informatization routinely reserves one-month stock for 29 shortage emergency drugs. The Municipal Medical Products Administration (MPA), with support from multiple government agencies, coordinates response to drug shortages within 10 working days. In terms of shortage caused by low price, the Municipal Healthcare Security Administration (MHSA) has the right to adjust the reimbursement price after investigation.

The Shanghai Medical Procurement Administrative Agency (SMPA), affiliated to the Shanghai MHSA, gathers shortage information by monitoring purchasing on the Sunshine Medical Procurement All-In-One website and regular reports from hospitals. Based on the monitoring information, SMPA compares the local situation to national shortage statistics and determines whether the insufficient drugs are caused by interrupted manufacturing, delayed shipment, or other reasons. SMPA announces a list of the shortage drugs online for procurements. If the supplier responds to the procurement order with quotes of reasonable price comparable to other regions, MHSA will accept the quotes and hospitals can purchase the drug accordingly.

In Guangdong Province, the Drug Administration Department of the Provincial Health Commission takes the responsibility to collect the use and stock information regarding to the 27 medicines on the provincial shortage list. Medicines for chronic diseases generally receive high priority from the Drug Administration Department and Provincial Healthcare Security Administration. With an annual subsidy of 4.5 million RMB by the provincial government, shortage medicines valued more than 30 million RMB have been reserved in Guangdong. To ensure the drug supply at PHCs in the remote areas, tertiary hospitals are required to equip emergency drugs and other commonly used drugs for PHCs nearby. Furthermore, different levels of hospital have formed consortia to increase their purchasing power and thus improve the drug supply.

#### Box 2 Case study on drug procurement platforms

Led by the Chongqing municipal government, the Pharmaceutical Exchange (PE) was founded in March 2010. It's a third-party trading platform to provide online services for tendering for and purchasing medical products such as pharmaceuticals, medical devices, and medical disposable products. Hospitals, manufacturers and distributors can register membership on PE after their qualifications have been reviewed and accredited. Under the ceiling price set by PE, the purchaser and suppliers directly negotiate price, select distributors, and sign electronic contracts on PE. The medical institutions are obligated to remit to the PE

within 60 days after signing the contract. Then PE performs check on all transaction procedures before settling the payment. Because the trading information on the PE website is publicly available, it significantly increases the transparency and make government regulation and public supervision more convenient.

The Shanghai Sunshine Medical Procurement All-in-One website was established in 2015 and operated by the public institution known as the Shanghai Medical Procurement Administrative Agency (SMPA). It is a municipal procurement platform connecting public hospitals, private hospitals and pharmacies designated by health insurance authority, manufacturers and distributors. The medical institutions and pharmacies are required to purchase all the medicines they need through the platform, except those hospital-made preparations and traditional Chinese medicines preparations, and to upload invoice information in a standardized format. SMPA has also developed a set of uniform codes for all medicines to monitor the volume and prices of sales.

In Guangdong province, in addition to the provincial not-for-profit bidding platform operated since 2013, Shenzhen and Guangzhou cities developed their own platforms for procurement in 2017 and 2018, respectively. In Shenzhen, the portfolio of commonly used medicines for all public hospitals with their estimated volume in one year forms a bulk procurement order. With a predetermined budget, the order was then entrusted to a third-party group purchasing organization (GPO) to complete purchase from the suppliers. The group purchasing in Guangzhou was conducted by the municipal Healthcare Security Administration and its online platform was operated by Guangzhou Public Resources Trading Center. In other prefecture-level cities in Guangdong, at least one of the three platforms had to be used to conduct drug purchase for public hospitals up to June 2019.