# DUE DILIGENCE OF CAMBODIA'S HEALTHCARE WASTE MANAGEMENT SYSTEM

## I. BACKGROUND

1. Since 27 January 2020, when Cambodia confirmed the first case of coronavirus disease (COVID-19), the government has implemented numerous measures to prevent the spread of the virus with technical support from the World Health Organization (WHO) and other international organizations.

2. The initial stage of the COVID-19 vaccination plan, targeting 10 million people, was projected to generate approximately 200 tons of immunization waste, primarily sharps and safety boxes (130-140 tons), and used vials, cotton swaps, packaging and personal protection equipment (60-70 tons).[1] This increase in healthcare waste (HCW) can overwhelm existing HCW management systems, potentially exposing health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries.

3. This assessment documents the legal and regulatory framework of the Government of Cambodia, as well as current practices for HCW management; and documents the government's strategy and plan to manage immunization waste that will be generated during the COVID-19 vaccination campaign.

4. The assessment was undertaken through meetings with the Ministry of Health (MOH), the National Immunization Program (NIP) and the Ministry of Environment (MOE). Meetings were also held with the World Bank, United Nations Development Programme and WHO to discuss ongoing programs and projects in the field of HCW management.

## II. LEGAL AND REGULATORY FRAMEWORK

5. Cambodia has a relatively robust legal and policy framework regulating HCW management. Relevant national regulations and requirements on HCW management are discussed in the succeeding sections.[2]

6. Solid waste management is primarily regulated through the **Law on Environmental Protection and Natural Resources Management (1996)**, **Sub-Decree No. 36 on Solid Waste Management (1999)** and **Sub-Decree No. 113 on Urban Solid Waste Management (2015)**. Cambodia's Law on Environmental Protection and Natural Resource Management (1996) designates the MOE as the leading agency tasked with formulating policies, issuing regulations and coordinating actions on waste management and pollution control. Sub-Decree No. 36 on Solid Waste Management stipulates that the collection, transportation, recycling, minimization and disposal of waste in provinces and cities is the responsibility of provincial and city authorities. Sub-Decree No. 113 on Urban Solid Waste Management confirms this administrative organizational structure.

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[1] Experience from recent large-scale immunization programs suggests an immunization waste generation rate of 10 tons per 1 million vaccine doses. Source: Health Care Without Harm, Philippines Department of Health. 2004. *Waste Management and Disposal During the Philippine Follow-up Measles Campaign*. Manila.

[2] Cambodia is also signatory or member state to three key international agreements and conventions of relevance to HCW management, including (i) The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (ratified in 2001); (ii) The Stockholm Convention on Persistent Organic Pollutants (ratified in 2001); and (iii) The Minamata Convention on Mercury (signed in 2013).

7. Sub-Decree 36 defines what fractions of solid waste classify as hazardous wastes. Infectious waste and waste from production of drugs and medicines, as well as expired drugs are classified as hazardous waste. The sub-Decree specifies that any treatment or disposal facility for hazardous waste is subject to prior approval from the MOE. Per sub-Decree, the monitoring of packing, storage, transport, recycling, treatment, and disposal of hazardous waste is the responsibility of the MOE.

8. **The Environmental Guidelines (Ordinance) on Solid Waste Management in the Kingdom of Cambodia (2006)**[3] issued by the MOE apply to all activities related to discarding, storage, collection, transport, recycling, treatment, composting and disposal of all kinds of solid waste. The Ordinance includes guidelines specific to HCW. The guidelines classify HCW into three categories, including general non-hazardous waste, sharp waste, and infectious waste, and provide directives on segregation, packaging, temporary storage, and treatment. The guidelines also specify HCW monitoring requirements at point of production, during transport, and at point of treatment/disposal. According to the guidelines, three treatment options are possible for HCW, including incineration, disinfection, and sterilization. The type of treatment also affects acceptable disposal options. The disposal in landfills of untreated HCW including sharp waste and infectious waste is not permitted.

9. The MOE issued in 2016 the **Guidelines on Urban Solid Waste Management** specifically for the design and operation of landfills to help address the problems brought about by operation of open dumpsites.[4] The guidelines prescribe the criteria on site selection that takes into consideration distance to receptors, hydrology of the area, cell design, drainage system, and economic value or use of the land. As compared to international standards, the Cambodian guidance is most stringent for distance to housing (1km) and depth to ground water (>3m).

10. MOE is currently preparing a **sub-Decree on hazardous waste management**, which covers HCW. The sub-Decree is expected to be finalized in 2022.

11. In addition to MOE, the MOH also plays a central role in setting regulations for HCW management. MOH provides the legal framework for managing the environmental and social risks in the health sector, and issues regulations relating to HCW management through sub-Decrees and technical guidelines on waste segregation, collection, storage, transportation, treatment, and disposal.

12. In 2008, MOH issued the **Regulation (*Prakas*) on Healthcare Waste Management in Cambodia**.[5] The *Prakas* provides definitions of all categories of HCW; the requirements for the identification, labelling and classification of HCW; and technical requirements for segregation, collection, storage, handling, transportation, treatment, and disposal of all categories of wastes generated from healthcare establishments in Cambodia. Based on Article 18 of the *Prakas*, treatment and disposal of HCW may be through high temperature incineration,[6] sterilization chemical treatment, dry and wet treatment, microwave, landfilling, or inertization and encapsulation. The emissions from incineration must comply with the maximum allowable discharge levels of particulate matter and the maximum allowable concentration of hazardous substance in ambient air in accordance with MOE Sub-Decree ANK/BK No. 42 (July 2000) on the

[3] MOE. 2006. *Environmental Guidelines on Solid Waste Management in the Kingdom of Cambodia*. Phnom Penh.
[4] MOE. 2016. *Guidelines on Urban Solid Waste Management*. Phnom Penh.
[5] MOH. 2008. *Prakas on Health-Care Waste Management in Cambodia*. Phnom Penh. A “prakas” is comparable to a proclamation or declaration that is a ministerial or inter-ministerial decision signed by the relevant minister(s).
[6] Emissions from incineration must comply with MOE Sub-Decree ANK/BK No. 42 (July 2000) on the control of air pollution and noise disturbance.

control of air pollution and noise disturbance. Per sub-Decree, incinerators should be designed with combustion temperature ranging from 800°C–1200°C.

13. In 2012, MOH issued the **Technical Guideline on Healthcare Waste Management (2012)** with technical assistance of the WHO.[7] The guideline operationalizes the MOH *Prakas* on Healthcare Waste Management (2008), as well as the MOE Law on Environmental Protection and Natural Resource Management (1996) and its Sub-Decree 36 on Solid Waste Management (1999). It defines subcategories of HCW,[8] and provides technical specifications for specific components of HCW management, including (i) segregation, packaging, labelling and temporary storage for HCW; (ii) HCW transportation; (iii) local pre-treatment and/or disposal; and (iv) treatment and safe disposal (landfilling). MOH has requested support from the Asian Development Bank (ADB) to update the Technical Guideline. Such support will be provided through the Health Security Project (Additional Financing), approved by ADB in October 2021.

14. **The National Guidelines for Infection Prevention and Control (IPC) in Health Facilities (2017)** issued by MOH provide detailed measures and procedures for standard precautions, transmission-based precautions, and specific procedures for managing patients in isolation unit/centers.[9] The guidelines also specify requirements for safe HCW handling and storage within health care facilities (HCFs), in line with the MOH Technical Guideline on Healthcare Waste Management (2012). The national guidelines are consistent with WHO's guidelines for IPC in health facilities.

15. MOH is in the process of developing and rolling out its first **healthcare accreditation system** with support of United States Agency for International Development.[10] The road map for the accreditation system was completed in May 2019, and the Cambodian Accreditation Standards (CHAS) was completed in November 2020. Certification of Accreditation Coordinators and Certifying Surveyors is ongoing. Around 20 hospitals (including 13 public and 7 private hospitals) are currently being prepared to meet the CHAS. One of the critical accreditation criteria is the establishment and maintenance of facility-adapted policy and procedures on hazardous materials and healthcare waste management as part of the Environmental Safety and Security Standards of the CHAS.[11]

## III. CURRENT PRACTICES IN HEALTHCARE WASTE MANAGEMENT

16. The public health network in Cambodia comprises more than 1,400 health facilities, including (i) 9 national hospitals in Phnom Penh providing high-level tertiary care; (ii) 24 provincial and 92 district referral hospitals (RH) providing clinical services at three levels;[12] and (iii) 1,229 health centers providing primary health and basic clinical services.[13] According to the National Deployment and Vaccination Plan (NDVP) and subsequent updates (hereinafter referred to as the Vaccination Plan), COVID-19 vaccines have been primarily delivered through the nine national hospitals, the provincial and district RHs and the health centers. In addition, vaccinations

[7] MOH. 2011. *Technical Guidelines on Healthcare Waste Management*. Phnom Penh.
[8] Including: infectious waste, pathological waste, sharp waste, pharmaceutical waste, genotoxic waste, chemical waste, waste with high content of heavy metals, pressurized containers and radioactive waste
[9] MOH. 2017. *National Guidelines for IPC in Health Facilities*. Phnom Penh.
[10] Through the United States Agency for International Development-funded Enhancing Quality of Healthcare Activity project.
[11] MOH. 2020. *Cambodia Hospital Accreditation Standards Manual*. Phnom Penh.
[12] Hospitals are categorized as *complementary package of activities levels 1 to 3* based on the mix of clinical services, number and composition of staff, number of beds, standard drug kit, standard medical equipment.
[13] MOH. 2021. *National Deployment and Vaccination Plan For COVID-19 Vaccines – National Immunization Program*. Phnom Penh.

are also carried out using mobile clinics at temporary operational district (OD) vaccination centers as determined by the Ad-hoc Commission for COVID-19 Vaccination (ACC). The following sections review current practices regarding HCW management in Cambodia, with a special focus on those facilities primarily involved in the COVID-19 vaccination campaign.

17. HCW management capacities and practices depend on the location and the type of HCFs. In Phnom Penh, HCFs segregate HCW in accordance with the MOH Technical Guideline on HCW management, with off-site treatment and disposal. HCW collection and treatment is currently handled by the Medical Waste Management Unit (MWMU) of Red Cross Cambodia, which was established in 2009 to provide collection, transportation, treatment and final disposal services to the HCFs in the city through service contracts with the HCFs.[14] MWMU collects the segregated and stored HCW from HCFs and transports it to the incineration plant adjacent the city's Dangkor landfill site (built in 2009 with assistance from Japan International Cooperation Agency). At the MWMU treatment facility, HCW is incinerated at up to 1,200 °C, with residues disposed in a segregated pit at the Dangkor landfill. MWMU operates as a private service provider and generates revenue through the 2,214 service contracts with HCFs. The HCW management system in Phnom Penh is considered relatively robust by MOH and MOE.

18. Outside of Phnom Penh, HCWM has historically been more problematic, with several HCFs (especially CPA-1 and CPA-2 RHs and health centers) either burning their HCW in simple, low-temperature on-site incinerators, or - given the absence of licensed HCW transporters and treaters[15] - mixing it with general waste which is eventually dumped in uncontrolled landfills. Technical specifications for those on-site incinerators do not meet the standards for temperature (800-1,200 °C), and none has the necessary operating license from MOE.[16] Landfills usually lack control, are poorly managed and may pose a significant risk to the environment and possibly to public health. To this day, there are no landfills with dedicated areas where hazardous waste including HCW could be safely disposed.[17] The government is in the process of constructing improved landfills for municipal waste disposal in several cities, including with support of the ADB.[18]

19. The situation is slightly different for waste generated during immunization campaigns, including the ongoing COVID-19 vaccination campaign. Sharps and syringes are collected in safety boxes.[19] HCFs with on-site treatment facilities treat such waste on-site and dispose residues together with municipal solid waste. In HCFs that lack on-site treatment systems, immunization waste including used syringes and vials is collected in safety boxes provided by the

[14] Decision on creation of MWMU, No. 96 of Red Cross Cambodia (2009).

[15] The MOH Technical Guidelines on Healthcare Waste Management (2012) specify that HCW transport from HCF to an offsite treatment facility is subject to special permits by the Ministry of Environment.

[16] According to the MOH Technical Guidelines on Healthcare Waste Management (2012), HCW treatment and disposal facilities are subject to special permits by MOE (Section 3.12), the issuance of which is subject to submission of acceptable Standard Operating Procedures (SOPs), Emergency Response Plans (ERP) and Contingency Plans (CP).

[17] Director of Hazardous Waste Department, Ministry of Environment (personal communication on 26 February 2021).

[18] ADB has been and is currently supporting the Government of Cambodia in constructing improved landfills in several cities, including in Kep (through the Second Greater Mekong Subregion Tourism Infrastructure for Inclusive Growth Project); Kampot (through the Second Greater Mekong Subregion Corridor Towns Development Project); Kampong Cham, Kratie and Stung Treng (through the Fourth Greater Mekong Subregion Corridor Towns Development Project); Pursat and Kampong Chhnang (through the Integrated Urban Environmental Management in the Tonle Sap Basin Project); and Serei Soaphoan, Stung Saen and Battambang (through the Second Urban Environmental Management in the Tonle Sap Basin Project). Improved landfills are currently being considered in Bavet and Poipet under the proposed Livable Cities Investment Project.

[19] Based on meeting with MOH (February 26, 2021), one safety box with capacity of 5 liters can accommodate about 200 used syringes.

Operational District (OD) to the HCF when these collect vaccines at OD drugstores. Full safety boxes are returned by HCF to the OD who processes the collected sharps in incinerators or other treatment facilities available at RHs. The OD issues a new safety box to the HCF only after receiving the filled safety box from the HCF. This system is also applied for temporary OD vaccination centers.

20. In recent years, MOH has taken strong action to address shortcomings and regional disparities in HCW service coverage through a series of programs and projects supported by international development partners.

21. Between 2017 and 2021, advanced HCW incinerators were installed in 25 provincial and district RHs with support of the Global Fund. Through the Greater Mekong Subregion Health Security Project financed by ADB and the Health Equity and Quality Improvement Project co-financed by the World Bank and the governments of Australia, Germany and the Republic of Korea, state-of-the-art, integrated HCW treatment systems were installed in 50 RHs in 2020 alone (see list in Appendix 1).[20] The systems allow for on-site conversion of bio-hazardous HCW including sharps into ordinary municipal waste. The waste is sterilized using microwaves, reducing its volume by more than 80% and its weight by 25%. A standard operating procedure (SOP) was developed by the equipment supplier, who also provided training to hospital personnel on waste segregation, storage, treatment equipment operation. The Heath Security Project (Additional Financing) approved by ADB in October 2021 will provide 42 additional HCW treatment systems to those provincial and district RHs with no or limited access to treatment systems (Appendix 1).[21]

22. In Phnom Penh, four microwave-based HCW treatment equipment has been installed and capacity building support is being provided to two COVID-19 designated hospitals through the Proper and Safe Treatment of Medical Waste to Prevent COVID-19 Project implemented by United Nations Development Programme and financed by the government of the People's Republic of China.[22]

## IV. GOVERNMENT'S PLAN TO ENSURE ADEQUATE MANAGEMENT OF IMMUNIZATION WASTE FROM COVID-19 VACCINATION

23. The vaccination plan has outlined immunization waste management requirements and procedures. Vaccination is provided at pre-defined sites only, including national hospitals, provincial and district RHs, health centers and temporary OD vaccination centers. HCF directors and vaccination site supervisors are responsible for all matters of vaccine deployment and vaccination in their facility, including immunization waste management. All healthcare workers involved in COVID-19 vaccination have to follow all the precautions set by the MOH, including precautions mentioned in the National Guidelines on Vaccination Safety and Waste and Disposal Management System for Vaccination Program.

24. Each provincial health department (PHD) has provided the NIP an inventory of high temperature incinerators and other immunization waste treatment systems (see inventory in Appendix 1). Participating RHs, health centers and temporary OD vaccination centers without on-site treatment system are required to coordinate with nearby RHs that have an on-site treatment

[20] ADB. Greater Mekong Subregion Health Security Project; and World Bank. Cambodia – Health Equity and Quality Improvement Project.
[21] ADB. Cambodia: Greater Mekong Subregion Health Security Project (Additional Financing) Accessible here.
[22] Including Khmer-Soviet Friendship Hospital (2) and National Maternal and Child Health Hospital (2).

system. SOP for COVID-19 immunization waste management has been prepared and disseminated to all vaccination teams through training events (para 28).

25. Each vaccination site is required to comply with the following, as defined in the vaccination plan:

- Directors of RHs and health centers, and the officials in charge of the temporary OD vaccination centers shall be responsible to ensure proper collection and disposal of HCW in accordance with the SOP and with the guidance from sub-commissions for Capital/Provinces and the PHDs;
- New safety boxes shall be supplied by the PHD and/or OD drugstores together with new vaccines;
- The full safety boxes must be stored and safe temporary storage sites, before being incinerated or treated at pre-identified sites and as per established practice as soon as possible after vaccination;
- The process of collection, storage, treatment and disposal shall be monitored by the vaccination site supervisors and reported to OD Health Offices.
- Sub-commissions for Capital/Provinces, Directors of PHDs OD Health Offices shall be equipped with sufficient means and resources to collect, store and destroy post-vaccination wastes for those sites without treatment capacities.

26. **Organization, Staffing.** The nationwide COVID-19 vaccination deployment is led, managed, and coordinated by the ACC, established by Royal Government Decision Nº37. SSR, dated 17 March 2021, with the composition from line ministries, institutions, units and the 25 capital and provincial administrations. Sub-commissions have also been established in the spirit of the above-mentioned Decision to manage and administer the COVID-19 vaccination work in accordance with the roles set out in the directive of the line ministries and institutions in coordination with ACC and other relevant partners. The ACC sub-commissions are required to cooperate and coordinate with the NIP and the PHDs in mobilizing additional human resources and organizing training courses. Each OD selects a vaccination team leader from the OD office and assigns vaccination teams. The team leader is responsible to ensure the vaccines and supplies, and immunization safety at vaccination sites including HCW management. Provincial coordinators (2-5 per province) are assigned to work with the team leaders.

27. At vaccination sites, vaccination teams consisting of at least 10 members are established. These consist of a head of the vaccination team, a physician, a nurse, two vaccination staff, two data processing staff, and three support staff. Each facility also assigns staff in charge of HCW management.

28. **Training.** NIP, with the support from development partners, conducted training workshops in February and March 2021. These trainings included Training of Trainers at national level for PHD and OD staff for the COVID-19 vaccination campaign. Subsequently, central NIP, PHD and partners have assisted ODs to conduct planning and training workshops with national hospital, provincial and district RH, health center and temporary OD vaccination site staff.

29. **Monitoring and Reporting.** The vaccination plan clearly outlines monitoring and reporting requirements. The Sub-commission on Monitoring and Evaluation of the ACC is responsible for establishing and launching an online monitoring and reporting system throughout the country. Daily, weekly and monthly vaccination result reports from each site across the ODs, capital/provinces and the country will be generated, compiled, and checked for accuracy. The

evaluation of the COVID-19 vaccination deployment will be conducted by the ACC Sub-commission on Monitoring and Evaluation in collaboration with the NIP and other stakeholders. Furthermore, a Post Introduction Evaluation (PIE) financed by ADB will be conducted in 2022 using the New Vaccine PIE Tool.[23] The PIE will, among others, assess and report on injection safety and waste management. NIP will organize a dissemination workshop after completing the vaccination campaign and PIE in the country. The workshop will encompass head of PHDs, focal persons from selected ODs, and core partners. A detailed performance report, which will cover waste management including challenges and lessons learned, will be prepared and disseminated by NIP in the framework of the PIE.

## V. CONCLUSION

30. Cambodia has a robust regulatory and policy framework for HCW management which is continuously being enhanced to align with international good practice. MOH has taken strong action to enhance HCW management capacities throughout the country, primarily through support of development partners including ADB. According to the latest inventory of HCW treatment facilities, most CPA-3 and CPA-2 RHs have access to advanced HCW treatment facilities, with capacities still limited in CPA-1 RHs and health centers. These gaps will be further reduced through the Health Security Project Additional Financing, approved in October 2021.

31. Immunization waste management requirements and responsibilities are outlined in the vaccination plan which are based on Cambodia's well-established system of waste management resulting from routine immunization programs at health facilities. Each facility participating in the COVID-19 immunization program is required to comply with these requirements. COVID-19 vaccinations are primarily conducted in national hospitals, provincial and OD RHs where HCW management capacities are higher, also as a result of recent efforts to increase HCW treatment capacities in those facilities.

32. Health centers and temporary OD vaccination sites have established immunization waste collection systems in accordance with established and tested protocols for routine immunization campaigns. Immunization waste is collected in safety boxes provided by the ODs. Full safety boxes are returned to the ODs for further processing in incinerators or other treatment facilities available at RHs.

33. Based on the assessment, the government's plan of action and current practices indicates that the incremental waste from the roll-out of the COVID-19 vaccination program is being effectively managed through implementation of the waste management requirements defined in the vaccination plan. This will be further verified via the WHO New Vaccine PIE Tool and reported by NIP through workshops and the PIE report.

[23] World Health Organization. 2010. *New Vaccine Post-Introduction Evaluation (PIE) Tool*. Geneva.

**Appendix: Inventory of Referral Hospitals Equipped with Advanced Healthcare Waste Treatment Equipment (Status November 2021)**

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| 1 | Banteay Mean Chey | 1 | PRH Mongkul Borey | CPA-3 | 1 | | | |
| | | 2 | Poipet | CPA-2 | 1 | | | |
| | | 3 | **O Chrov*** ** | **CPA-1** | | | | |
| | | 4 | **Malay Santepheap*** ** | **CPA-1** | | | | |
| | | 5 | Preah Net Preah | CPA-1 | | | 1 | 2020 |
| | | 6 | **Phnom Srok** | **CPA-1** | | | | |
| | | 7 | Thmor Pouk | CPA-2 | 1 | | | |
| | | 8 | **Svay Chek*** ** | **CPA-1** | | | | |
| | | 9 | **Serey Sophorn** | **CPA-1** | | | | |
| 2 | Battambang | 10 | **Thmor Kol*** ** | **CPA-1** | | | | |
| | | 11 | **Bovel*** ** | **CPA-1** | | | | |
| | | 12 | Mong Russey | CPA-2 | 1 | | | |
| | | 13 | Sampov Loun | CPA-2 | 1 | | | |
| | | 14 | PRH Battambang | CPA-3 | 1 | | | |
| | | 15 | **Roka** | **CPA-1** | | | | |
| | | 16 | **Ek Phnom*** ** | **CPA-1** | | | | |
| 3 | Kampong Cham | 17 | Chamkar Leu | CPA-2 | | 1 | | |
| | | 18 | Cheung Prey | CPA-2 | | 1 | | |
| | | 19 | PRH Kampong Cham | CPA-3 | | 1 | 1 | 2020 |

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| | | 20 | **Prey Chhor** | **CPA-1** | | | | |
| | | 21 | **Srey Santhor*** ** | **CPA-2** | | | | |
| | | 22 | Stung Trang | CPA-1 | | 1 | | |
| | | 23 | **Batheay*** ** | **CPA-1** | | | | |
| | | 24 | **Koh Sotin*** ** | **CPA-1** | | | | |
| | | 25 | **Kang Meas*** ** | **CPA-1** | | | | |
| 4 | Kampong Chhang | 26 | PRH Kampong Chhnang | CPA-3 | | 1 | 1 | 2020 |
| | | 27 | Kampong Tralach | CPA-1 | | 1 | | |
| | | 28 | **Boribo** | **CPA-1** | | | | |
| 5 | Kampong Speu | 29 | Provincial RH Kampong Speu | CPA-3 | | 1 | 1 | 2020 |
| | | 30 | Kong Pisey | CPA-2 | | | 1 | 2020 |
| | | 31 | Oudong | CPA-2 | | 1 | | |
| | | 32 | **RH Trapaing Kraleung** | **CPA-1** | | | | |
| 6 | Kampong Thom | 33 | Baray Santuk | CPA-2 | | 1 | 1 | 2020 |
| | | 34 | PRH Kampong Thom | CPA-3 | | 1 | 1 | 2020 |
| | | 35 | Stoung | CPA-2 | | 1 | | |
| 7 | Kampot | 36 | Angkor Chey | CPA-2 | 1 | | | |
| | | 37 | Chhouk | CPA-2 | 1 | | 1 | 2017 |
| | | 38 | **Taken Koh Sla** | **CPA-1** | | | | |
| | | 39 | Kampong Trach | CPA-2 | 1 | | | |

10 Appendix

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| | | 40 | Provincial RH Kampot | CPA-3 | 1 | | | |
| 8 | Kandal | 41 | **Ang Snoul*** ** | **CPA-1** | | | | |
| | | 42 | **Kien Svay** | **CPA-1** | | | | |
| | | 43 | Koh Thom | CPA-2 | 1 | | | |
| | | 44 | **Khsach Kandal*** ** | **CPA-1** | | | | |
| | | 45 | **Bun Rany Hun Sen Roka Korng*** ** | **CPA-2** | | | | |
| | | 46 | **Ponhea Leu*** ** | **CPA-2** | | | | |
| | | 47 | **Saang** | **CPA-1** | | | | |
| | | 48 | **PRH Chey Chum Neah (Tahmao)*** ** | **CPA-3** | | | | |
| | | 49 | **RH Kandal Stung*** ** | **CPA-1** | | | | |
| | | 50 | **Lovea Em*** ** | **CPA-1** | | | | |
| | | 51 | **Leuk Dek*** ** | **CPA-1** | | | | |
| 9 | Koh Kong | 52 | Provincial RH (Smach Mean Chey) | CPA-2 | | 1 | 1 | 2017 |
| | | 53 | **Sre Ambel*** ** | **CPA-1** | | | | |
| 10 | Kratie | 54 | Provincial RH Kratie | CPA-3 | 1 | | 1 | 2017 |
| | | 55 | **RH Chhlong*** ** | **CPA-2** | | | | |
| | | 56 | RH Snoul | CPA-1 | 1 | | | |
| 11 | Mondulkiri | 57 | PRH Mondulkiri | CPA-2 | 1 | | | |
| | | 58 | RH Koh Nhek | CPA-1 | | | 1 | 2017 |
| 12 | Phnom Penh | 59 | **RH Samdech Ov** | **CPA-1** | | | | |

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| | | 60 | **Municipality RH (PRH) Phnom Penh*** ** | **CPA-3** | | | | |
| | | 61 | **Chaktumuk** | **CPA-1** | | | | |
| | | 62 | **Pochentong** | **CPA-1** | | | | |
| | | 63 | **Mean Chey (Bassak)** | **CPA-1** | | | | |
| | | 64 | **Cambodia-Chinese RH Sensok** | **CPA-1** | | | | |
| | | 65 | **Dangkor** | **CPA-1** | | | | |
| | | 66 | **Prek Phnov** | **CPA-1** | | | | |
| | | | **Chakangre (HC upgraded to RH)** | **CPA-1** | | | | |
| 13 | Preah Vihear | 67 | Provincial RH 16 Makara | CPA-3 | 1 | | 1 | 2017 |
| | | **68** | **Rh Chomksan*** ** | **CPA-1** | | | | |
| 14 | Prey Veng | **69** | **Kamchay Mear*** ** | **CPA-1** | | | | |
| | | 70 | Kg Trabek | CPA-2 | 1 | | | |
| | | 71 | Mesang | CPA-1 | | | | |
| | | 72 | **RH Neak Leung*** ** | **CPA-2** | | | | |
| | | 73 | Pearaing | CPA-2 | 1 | | | |
| | | 74 | Preah Sdach | CPA-1 | 1 | | | |
| | | 75 | **Svay Antor*** ** | **CPA-1** | | | | |
| | | 76 | Sithor Kandal | CPA-1 | | | 1 | 2020 |
| | | 77 | PRH Prey Veng | CPA-3 | 1 | | | |
| | | 78 | **Ba Phnom*** ** | **CPA-1** | | | | |

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| | | 79 | **Peam Chor*** ** | **CPA-1** | | | | |
| | | 80 | **Kanhchreach*** ** | **CPA-1** | | | | |
| 15 | Pursat | 81 | Bakan | CPA-1 | | 1 | | |
| | | 82 | PRH Pursat | CPA-3 | | 1 | 1 | 2020 |
| | | 83 | Kravanh | CPA-1 | | | 1 | 2020 |
| | | 84 | Krakor | CPA-1 | | 1 | | |
| 16 | Ratanakiri | 85 | Provincial RH Ratanakiri | CPA-3 | 1 | | | |
| | | 86 | Bor Keo | CPA-1 | | | 1 | 2020 |
| 17 | Siem Reap | 87 | RH Kralanh | CPA-1 | | 1 | | |
| | | 88 | Provincial RH Siem Reap | CPA-3 | | 1 | | |
| | | 89 | Sotnikum | CPA-2 | | | 1 | 2020 |
| | | 90 | RH Angkor Chum | CPA-1 | | 1 | | |
| | | 91 | **RH Pouk*** ** | **CPA-1** | | | | |
| 18 | Preah Sihanouk | 92 | Provincial RH | CPA-3 | | 1 | 1 | 2020 |
| 19 | Steung Treng | 93 | Provincial RH | CPA-3 | 1 | | | |
| 20 | Svay Rieng | 94 | Chiphou | CPA-1 | 1 | | | |
| | | 95 | Romeas Hek | CPA-2 | | | 1 | 2020 |
| | | 96 | PRH Svay Rieng | CPA-3 | 1 | | | |
| | | 97 | **Svay Chrum*** ** | **CPA-1** | | | | |
| | | 98 | **Svay Teap** | **CPA-1** | | | | |

| | Province | | Hospital location | Level | Sterilwave (SW-100) supplied by | | Incinerators (MP-100) supplied by | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ADB* (2020) | WB** (2020) | Global Fund | Year installed |
| | | 99 | **Samaki Rumdoul*** ** | **CPA-1** | | | | |
| 21 | Takeo | 100 | **Ang Rokar*** ** | **CPA-1** | | | | |
| | | 101 | **Bati*** ** | **CPA-1** | | | | |
| | | 102 | PRH (Takeo) | CPA-3 | | 1 | 1 | 2020 |
| | | 103 | Kirivong | CPA-2 | | 1 | | |
| | | 104 | Prey Kabbas | CPA-1 | | 1 | | |
| | | 105 | **Angkor Borey*** ** | **CPA-1** | | | | |
| | | 106 | **Koh Andet*** ** | **CPA-1** | | | | |
| 22 | Oddar Meanchey | 107 | Oddar Meanchey Provincial RH | CPA-2 | | 1 | 1 | 2020 |
| | | 108 | Anlong Veng | CPA-1 | | | 1 | 2020 |
| 23 | Kep | 109 | Provincial RH*** | CPA-1 | | | 1 | 2020 |
| 24 | Pailin | 110 | Provincial RH Pailin | CPA-2 | 1 | | 1 | 2017 |
| 25 | Tbaung Khmum | 111 | Preah Norodom Sihanouk (Soung) | CPA-2 | 1 | | 1 | 2021 |
| | | 112 | **Krochmar*** ** | **CPA-1** | | | | |
| | | 113 | Memut | CPA-2 | 1 | | | |
| | | 114 | **Oraing Ov*** ** | **CPA-1** | | | | |
| | | 115 | Ponhea Krek | CPA-2 | 1 | | | |
| | | 116 | **Damber** | **CPA-1** | | | | |
| | | | **Total** | | **27** | **23** | **25** | 2017-21 |

# 14 Appendix

Notes: Bold indicated those facilities without advanced HCW treatment equipment as of November 2021; CPA = Complementary Package of Activities, graded 1-3 on the basis of the number and composition of staff, number of beds, standard drug kit, standard medical equipment, and clinical activities. CPA-3 is the highest hospital level.
* Supplied through the Health Security Project funded by ADB.
** Supplied through the Cambodia COVID-19 Emergency Response Project funded by the World Bank.
*** To be supplied with SW-100 under Health Security Project (Additional Financing) in 2022.

| | |
|---|---|
| Total referral hospitals nationwide (national hospitals excluded) | 116 |
| Hospitals with Sterilwave (SW-100) | 50 |
| Hospitals with Incinerator (MP-100) | 25 |
| Hospitals with SW-100 and MP-100 | 15 |
| **Hospitals without advanced HCW treatment equipment (as of Nov 2021)** | **56** |
| CPA-3 hospitals without HCW treatment equipment | 2 |
| CPA-2 hospitals without HCW treatment equipment | 5 |
| CPA-1 hospitals without HCW treatment equipment | 49 |
| **Hospitals to be supplied with advanced HCW treatment equipment in 2022 under the Health Sector Project Additional Financing** | **42** |
| CPA-3 and national hospitals to receive HCW treatment equipment | 6 |
| CPA-2 hospitals to receive HCW treatment equipment | 7 |
| CPA-1 hospitals to receive HCW treatment equipment | 29 |