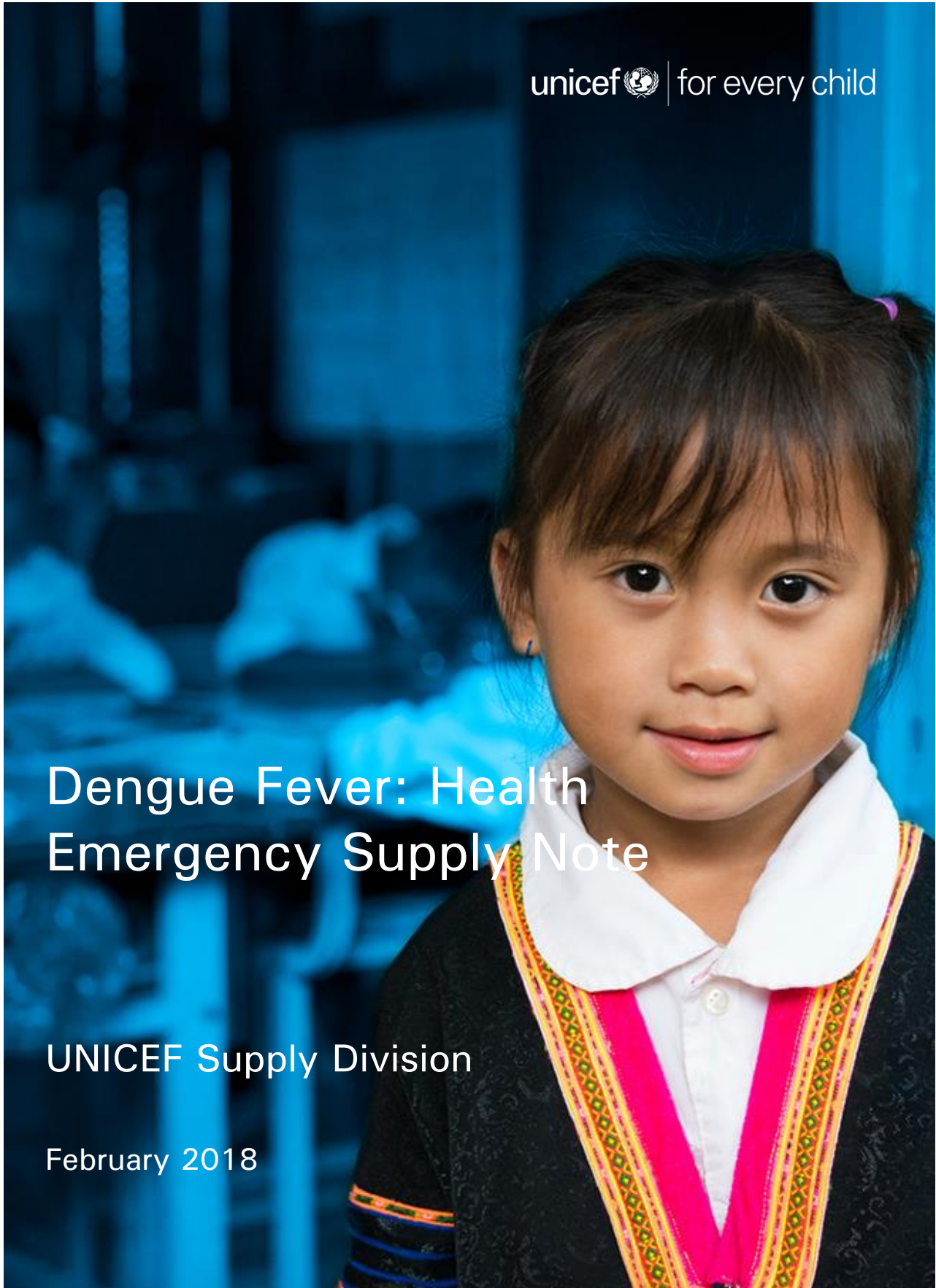


Dengue Fever: Health Emergency Supply Note

UNICEF Supply Division

February 2018



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1. Summary

UNICEF provides a list of available supplies for the prevention, detection, and emergency response to outbreaks of dengue virus. It includes supplies for diagnostics, infection prevention and control (IPC), and vector control. No antiviral treatment or WHO prequalified vaccine currently exists for dengue. Early detection, supportive care, and transmission prevention through vector control are currently the most effective interventions. UNICEF also provides details on how UNICEF country offices, governments, and partners can procure emergency supplies through UNICEF.

2. Background

The recent outbreaks of life-threatening infections and re-emerging infectious diseases highlight the need for prevention, preparedness, as well as effective emergency outbreak response. UNICEF launched its Health Emergencies Preparedness Initiative (HEPI) in September 2015 to strengthen its health emergency response capacity, in coordination with the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC). UNICEF identified diseases for which it is making organizational preparations and support packages. They include disease-specific technical guidance documents, pre-positioned stock and supply requirements, and includes dengue.

Any rapid response to an acute public health emergency requires an initial risk assessment to ensure defensible decision-making, including the implementation of appropriate control measures. A systematic approach to a public health risk assessment can provide the basis to prioritise actions to alleviate the consequences on affected populations.

Dengue is a viral disease and transmitted by the *Aedes* mosquito.¹ It is a flavivirus related to Japanese encephalitis, West Nile virus, yellow fever, and Zika virus. It is difficult to distinguish infection with dengue from Zika, as well as chikungunya, as they share a similar geographical spread, and some clinical signs. In most areas, children have the highest incidence of infection, with severe dengue being a leading cause of serious illness and death in some Asian and Latin American countries. Clinical symptoms include headaches, nausea, fatigue, fever, rash, and debilitating joint pain. Dengue infection can also develop into *severe* dengue, with life-threatening complications due to plasma leakage, fluid accumulation, respiratory distress, severe bleeding, and organ impairment. In order to avoid dengue clinical misdiagnosis with Zika, laboratory in vitro diagnostics covering the spectrum of arbovirus diseases is essential. Other serious conditions (e.g. bacterial infections) should be assessed and managed accordingly. There is no curative treatment for dengue, only palliative care to address symptomatic relief for fever, headaches, muscle, joint pain, and dehydration.

Dengue transmission prevention requires an integrated approach to vector control management and use of personal protective measures.² Prevention must focus on eliminating sources for mosquito breeding (i.e. community clean up, waste management, eliminating all sources and bodies of standing water), and larviciding suspected areas of transmission. WHO published a

¹ World Health Organization, [Dengue and Severe Dengue Fact Sheet](#), WHO, Geneva, July 2016.

² World Health Organization, [Integrated Vector Management](#), WHO, Geneva, 2017.

[Global Strategic Framework for Integrated Vector Management](#).³ Personal protection measures include at risk populations to reduce exposure to day-biting *Aedes aegypti* and *Aedes albopictus* mosquitoes by using long lasting insecticidal nets (LLIN) and insect repellent. UNICEF provides a detailed LLIN market update highlighting [LLIN market](#) supply availability.⁴ WHO's Strategic Advisory Group of Experts on Immunization (SAGE) also recommends countries to consider dengue vaccine introduction where geographic settings have epidemiological data indicating a high burden of disease.⁵ Currently, no dengue vaccine is WHO prequalified, although one dengue fever vaccine (CYD-TDV) is registered in several countries. See comments under vaccine, Table 2 UNICEF, Other Key Considerations.

3. Supply

UNICEF has developed a list of consumables and supplies that are available for procurement and use in the event of a dengue outbreak (Table 1).

Table 1 UNICEF Dengue Fever HEPI Supply List

Area	Item Description	Material Number	Unit
Clinical Management	See under "4. Other Key Considerations", Table 2		
Prevention IPC and PPE	Gloves, w/o powder, nitrile, L, disp./BOX-100	S0969026	Box
	Gloves, w/o powder, nitrile, M, disp./BOX-100	S0969025	Box
	NaDCC granules ½ kg **	S5006055	Each
	Calcium hypochlorite 65-70% **	S0000569	Pack
	Compress, gauze, 10x10cm, n/sterile/PAC-100	S0523015	Pack
	Safety box f. used syringes/ndls 5l/BOX-25	S0782208	Box
	Swabs, alcohol, for lab disinfection	S0000540	Box
Vaccine	No WHO prequalified vaccine is currently available		
Vector control	LLIN, 75-100d, w/b/g, 190x180x150cm LxWxH	S0000982	Each
Diagnostics	CareStart Malaria Pf/VOM (HRP2/pLDH) Ag Combo/KIT-25	S0003781	Each
	Rapid diagnostic test, Dengue, Duo NS1 / Ab/KIT-10	S0003772	Pack
	Rapid diagnostic test, Dengue, NS1 Detect rapid test/KIT-25	S0003436	Pack
	SD Bioline Malaria Pf/Pf/Pv/KIT-25	S0003583	Each
	Lancet, 2.0mm, disp./BOX-100	S0969023	Pack
	Lancet, 2.4 mm, disp./BOX-100	S0969024	Pack

Should interventions need operational or programmatic equipment for use in temporary structures during an outbreak, items should include the following:

Operational and Programmatic Supplies	Trousers, surgical, woven, size L	S0305081	Each
	Trousers, surgical, woven, size M	S0305080	Each
	Trousers, surgical, woven, size XL	S0305082	Each
	Tunic, surgical, woven, size L	S0305084	Each
	Tunic, surgical, woven, size M	S0305083	Each
	Tunic, surgical, woven, size XL	S0305085	Each

Source: UNICEF Supply Division

Note **: Classed as dangerous goods.

³ World Health Organization, [Global Strategic Framework for Integrated Vector Management](#), WHO, Geneva, 2004.

⁴ UNICEF, [Long-Lasting Insecticidal Nets \(LLINs\) Supply Update](#), UNICEF, Copenhagen, August 2016.

⁵ World Health Organization, [Dengue Vaccine: WHO Position Paper](#), WHO, Geneva, July 2016, p. 361-2.

4. Other Key Considerations

In addition to the items listed in Table 1 that address disease supplies, Table 2 includes a number of additional useful considerations, such as the interagency emergency health kit (IEHK), vector control, and vaccines for dengue. The IEHK is a standardized kit of essential medicines, supplies, and equipment designed to meet the basic health care needs of 10.000 persons for three months in large-scale emergencies.⁶ The kit is designed for use in emergency settings where medical supplies are disrupted and fill the needs until the medical supply chain is restored. Although the kit is not specifically designed for dengue outbreak response, it can be used for palliative care to address symptomatic relief where there is a disruption to basic medical supplies. The IEHK complete kit includes one basic unit and six supplementary units, ordered together or individually (see section 5. How to Procure Emergency Supplies through UNICEF).

Table 2 UNICEF Other Key Considerations – Continued Overleaf

Category	Description
Interagency Emergency Health Kit	<p>IEHK – Basic Unit: Material Number: S9901004</p> <p><i>The basic unit</i> contains essential medicines and medical devices (consumables and equipment) for a population of 1,000 persons for a period of three (3) months during emergency situations. The basic unit contains essential medicines (none of which can be injected) and medical devices (consumables and equipment essentially for dressing purposes). It can be used by healthcare workers with limited training.</p>
	<p>IEHK – Supplementary Unit 1 - Medicines: Material Number: S9901006</p> <p><i>The supplementary unit 1 - medicines</i> contains essential medicines for a population of 10.000 persons for a period of three (3) months. The selection and quantification of the medicines included are based on recommendations for treatments for target diseases. Reference is made to "MSF Essential Drugs - Practical Guidelines" and "MSF Clinical, Diagnostic and Treatment guidelines". This kit must only be used by physicians and other professional health workers.</p>
	<p>IEHK – Supplementary Unit 1a - Medicines: Material Number: S9901007</p> <p><i>The supplementary unit 1a - medicines</i> contains medicines that normally need import authorizations (narcotic / psychotropic substances). Since this kit is usually urgently required and needs to be shipped within 24 hours, it does not allow time to apply for import and export authorizations. Therefore, until further notice, UNICEF Supply Division will not require import authorizations for this kit. However, country offices ordering or receiving this kit are advised to investigate if their national authorities require an import authorization. For these shipments, UNICEF Supply Division will complete the "Notation Form for Emergency Supplies of Controlled Substances" and forward it to the DMA (Danish Medicines Agency). Please refer to Supply Directive CF/SD/2008/002 Rev 01 - ordering of narcotic and/or psychotropic pharmaceutical products. The IEHK supplementary 1a-medicines also contains medicines that need to be stored at controlled temperatures (cold chain +2 to +8°C). This kit is therefore only supplied via air shipment. This kit must only be used by physicians and other professional health workers.</p>
	<p>IEHK – Supplementary Unit 1b - Malaria: Material Number: S9901008</p> <p><i>The supplementary unit 1b – malaria</i> contains injectable anti-malarial medicines Quinine injection IV/IM 300mg/ml 2ml amp and Artesunate powder injection 60mg vial. The kit must only be used by physicians and other professional health workers. Temperature control temperature should not exceed 25°C.</p>
	<p>IEHK – Supplementary Unit 2 - Equipment: Material Number: S9901009</p> <p><i>The supplementary unit 2 - equipment</i> contains essential medical equipment (e.g. basic diagnostic and sterilisation equipment, medical utensils, and minor surgical instruments sets). It also includes items to allow for the provision of clean water. This kit must only be used by physicians and other professional health workers.</p>
	<p>IEHK – Supplementary Unit 3 - Renewable: Material Number: S9901010</p> <p><i>The supplementary unit 3 - renewable</i> contains essential consumable medical devices. Most</p>

⁶ World Health Organization, [Interagency Emergency Health Kit 2015](#), WHO, Geneva, 2017.

IEHK cont.	of the items are single use and sterile. <i>This kit must only be used by physicians and other professional health workers.</i>
Vector Control	<p>Vector Control Guidance WHO recommends well-implemented vector control programmes using existing tools and strategies to reduce the transmission of <i>Aedes</i>-borne diseases including dengue, including the use of larvicides, which has a high impact on reducing local mosquito population numbers, especially for <i>Aedes</i>. Please refer to WHO’s handbook for integrated vector management and information guidance on mosquito (vector) control emergency response and preparedness including dengue, accessible here:⁷ http://apps.who.int/iris/bitstream/10665/44768/1/9789241502801_eng.pdf</p> <p>Insect Repellent: Local Procurement <i>Item not provided in the list.</i> UNICEF recommends countries to procure insecticide repellents locally for use against dengue fever to ensure adherence to national regulatory approval conditions and labelling requirements. CDC advises insect repellent against mosquito bites should contain either 1-piperidinecarboxylic acid 2-(2-hydroxyethyl)-1-methylpropylester. (Icaridin), 3-[N-acetyl-N-butyl] amino propionic acid ethyl ester (IR3535), or N, N-diethyl-3-methylbenzamide (DEET), in accordance with national or regional regulatory bodies, accessible here.⁸ https://www.cdc.gov/zika/prevention/prevent-mosquito-bites.html</p>
Vaccine	<p>OBSERVATION – Dengue Vaccine: CYD-TDV/ DENG VAXIA®, Sanofi Pasteur <i>Item not provided in the list.</i> CYD-TDV / DENG VAXIA has not been WHO prequalified. WHO’s position paper on dengue fever vaccines (July 2016) profiles CYD-TDV, also known as DENG VAXIA produced by Sanofi Pasteur. CYD-TV is a freeze-dried live attenuated tetravalent vaccine requiring reconstitution, available in single- or five-dose vial. WHO does not recommend CYD-TDV in children under nine years of age and CYD-TDV has not been studied as an intervention for dengue outbreak control. However, although countries can introduce immunization during an outbreak as part of a dengue control strategy, WHO does not expect the vaccine to have a significant impact on the course of an ongoing outbreak. Some countries have approved CYD-TDV for use. See more here: http://www.who.int/wer/2016/wer9130.pdf?ua=1. WHO reports that there are approximately five other additional candidate vaccines under evaluation in clinical trials, including other live-attenuated vaccines. Read more on dengue vaccine research here: http://www.who.int/immunization/research/development/dengue_vaccines/en/</p>

Source: The Centers for Disease Control and Prevention, UNICEF Supply Division, and the World Health Organization.

5. How to Procure Emergency Supplies through UNICEF

5.1. UNICEF Country Office Orders for Health Emergency Supplies

In the event of an emergency, UNICEF country offices can access the UNICEF health emergency supply list above by raising an emergency UNICEF Sales Order (SO) through UNICEF's internal virtual integrated system of information (VISION), which manages all transactions.

UNICEF country offices raise and authorize SOs in VISION with an “Order Reason” stating emergency. UNICEF country offices can identify commodities online via [UNICEF’s Supply Catalogue](#), or UNICEF’s intranet [Emergency Supply List \(ESL\)](#). UNICEF Supply Division’s (SD) Emergency Coordinator (email: danemergency@unicef.org) receives the order in VISION. The Emergency Coordinator reviews and considers the order for approval.

Once approved in VISION, the order is automatically directed to the relevant UNICEF SD procurement centres. Procurement centres initiate procurement and raise Purchase Orders (PO) for the requested supplies from UNICEF SD’s warehouse in Copenhagen, or directly from suppliers located across the globe. UNICEF staff can access further detailed information via:

- [How to order - Emergency Orders and Emergency Supply Procurement Procedure](#)

⁷ World Health Organization, [Handbook for Integrated Vector Management](#), WHO, Geneva, 2012.

⁸ Centers for Disease Control and Prevention, [Prevent Mosquito Bites](#), CDC, Atlanta, October 2016.

- [Chapter 10 of UNICEF's Supply Manual](#)

5.2. Country Orders for Dengue Fever Vaccine

Currently, no dengue vaccine is WHO prequalified, although one dengue fever vaccine (CYD-TDV) is registered in several countries. WHO is awaiting for the manufacturer to submit an application for vaccine prequalification. UNICEF at present does not have a long-term arrangement with the manufacturer for the procurement of this vaccine. Any procurement requests for CYD-TDV through UNICEF would be subject to the operational steps established through UNICEF Procurement Services accessible here:

- https://www.unicef.org/supply/index_purchasing.html

Immunization campaigns require an effective cold chain to maintain optimal conditions during vaccine transport, storage, and handling. Should cold chain equipment and accessories appropriate for use in emergency interventions be required, they can be viewed online via UNICEF's Supply Catalogue (see above).

5.3. Government, External Partners and Other UN Agency Orders for Health Emergency Supplies

Partners (Governments, NGOs, other UN agencies) can access dengue health emergency supplies through UNICEF Procurement Services (PS). This mechanism may be more suited for the procurement of supplies for disaster preparedness activities rather than for emergency response given the required process. UNICEF encourages partners in country to consult supply staff in UNICEF country offices. Partners can also access detailed information via:

- **How to use UNICEF Procurement Services:**

https://www.unicef.org/supply/index_procurement_services.html

For further questions or additional information, please contact:

Stephane Arnaud
Emergency Coordination Unit
UNICEF Supply Division
+45 45 33 55 00
danemergency@UNICEF.org

Nagwa Hasanin
Technical Specialist
UNICEF Supply Division
+45 45 33 58 38
nhasanin@UNICEF.org

Aadrian Sullivan
Information Management
UNICEF Supply Division
+45 45 33 57 68
asullivan@UNICEF.org

Other UNICEF information notes are found at http://www.UNICEF.org/supply/index_54214.html.