

Office for the Coordination
of Humanitarian Affairs



J.
REFERENCE
MATERIAL



**United
Nations**

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Section contents

J.1 Conversion tables (imperial and metric)	345
J.2 Characteristics of aircraft commonly used during emergencies	347
J.3 Characteristics of helicopters commonly used during emergencies	349
J.4 Aircraft loading and offloading methods	350
J.5 Phonetic alphabet, standard UN call signs and radio prowords	352
J.6 Personal preparedness checklist	356
J.6.1 Overall readiness	356
J.6.3 UNDAC-specific documentation	356
J.6.4 Financial preparedness	356
J.6.5 Medical preparedness	357
J.6.6 Personal equipment & luggage	358
J.6.7 Cultural sensitivity and adaptation	360
J.6.8 En route	360
J.6.9 Climates	360
J.7 Comprehensive health and safety guidelines for environmental emergencies	364
J.7.1 Personal Protection Equipment (PPE)	364
J.7.2 CBRN Hazards	364
J.7.3 Personal hygiene/decontamination after debris operations	365
J.8 Medical emergencies and first aid	366
J.9 Protection mainstreaming activities by sector	371
J.10 Respiratory infections and other airborne transmitted pathogens	375
J.10.1 Definition & metrics	375
J.10.2 Impact on population	377
J.10.3 Potential aggravating factors	378
J.10.4 Typical assistance needs	378
J.10.5 Rapid risk assessment, impact analysis and forecast	380
J.10.6 Early/rapid impact estimations	382

J. REFERENCE MATERIAL

This chapter includes conversion tables, details on commonly used aircraft and helicopter characteristics, and loading and offloading methods. Additionally, you will find acronyms, a phonetic alphabet, and UN call signs for effective communication. For personal readiness, there is an extensive preparedness checklist covering various aspects. Moreover,

environmental experts have their own dedicated checklist, which includes health and safety guidelines. Finally, comprehensive guidance is provided on medical emergencies, first aid, and protection activities across sectors. This chapter serves as a reference for supporting preparedness, efficiency, and safety throughout your mission.

J.1 Conversion tables (imperial and metric)

METRIC TO IMPERIAL		IMPERIAL TO METRIC	
LENGTH		LENGTH	
1 cm	= 0.394 inches	1 inch	= 2.54 cm
1 m	= 39.4 inches	1 foot	= 30.5 cm
1 m	= 3.28 feet	1 foot	= 0.305 m
1 m	= 1.09 yards	1 yard	= 0.914 m
1 km	= 0.621 miles	1 mile	= 1.609 km
WEIGHT		WEIGHT	
1 g	= 0.035 ounces	1 ounce	= 28.3 g
1 kg	= 2.2 pounds	1 pound	= 454 g
1 ton	= 2200 pounds	1 pound	= 0.454 kg
1 ton	= 0.984 tons (US)	1 ton (US)	= 1.02 tons
SURFACE		SURFACE	
1 cm ²	= 0.155 sq in	1 sq inch	= 6.45 cm ²
1 m ²	= 10.76 sq ft	1 sq foot	= 929 cm ²
1 m ²	= 1.2 sq yd	1 sq foot	= 0.093 m ²

SURFACE		SURFACE	
1 ha	= 2.47 acres	1 sq yard	= 0.836 m ²
1 km ²	= 247 acres	1 acre	= 0.405 ha
1 km ²	= 0.386 sq miles	1 sq mile	= 2.59 km ²
VOLUME		VOLUME	
1 cm ³	= 0.061 cu in	1 cu inch	= 16.4 cm ³
1 m ³	= 35.3 cu ft	1 cu foot	= 0.028 m ³
1 m ³	= 1.31 cu yd	1 cu yard	= 0.765 m ³
1 ml	= 0.035 fl. oz	1 fl ounce	= 28.4 ml
1 l	= 1.76 pints	1 pint	= 0.568 l
1 l	= 0.22 UK gal.	1 UK gal.	= 4.55 l
1 US gal.	= 0.833 UK gal.	1 UK gal.	= 1.2 US gal.

Temperature
 (Celsius x 1.8) + 32 = Fahrenheit
 (Fahrenheit - 32) x 0.555 = Celsius

J.2 Characteristics of aircraft commonly used during emergencies

Aircraft Type	Cruising speed (knots)	Maximum cargo weight metric tons (2,200 lb)	Cargo hold size LxWxH (cm)	Door size WxH (cm)	Usable cargo volume (m3)	Pallet qty 224x318 (cm)	Desired runway length (ft)
AN-12		15	1,300 x 350 x 250	310 x 240	100	n/a	n/a
AN-22		60	3,300 x 440 x 440	300 x 390	630	n/a	n/a
AN-26		5.5	1,060 x 230 x 170	200 x 160	50	n/a	n/a
AN-32		6.7	1,000 x 250 x 110	240 x 120	30	n/a	n/a
AN-72/74		10	1,000 x 210 x 220	240 x 150	45	n/a	n/a
AN-124	450	120	3,300 x 640 x 440	600 x 740	850	n/a	10,000
A300F4-100		40	3,300 x 450 x 250	360 x 260	320	20	8,200
A300F4-200		42	3,300 x 450 x 250	360 x 260	320	20	8,200
A310-200F		38	2,600 x 450 x 250	360 x 260	260	16	6,700
A310-300F		39	2,600 x 450 x 250	360 x 260	260	16	6,700
B727-100F		16	2,000 x 350 x 210	340 x 220	112	9	7,000
B737-200F		12	1,800 x 330 x 190	350 x 210	90	7	7,000
B737-300F		16	1,800 x 330 x 210	350 x 230	90	8	7,000

Aircraft Type	Cruising speed (knots)	Maximum cargo weight metric tons (2,200 lb)	Cargo hold size LxWxH (cm)	Door size WxH (cm)	Usable cargo volume (m3)	Pallet qty 224x318 (cm)	Desired runway length (ft)
B747-100F		99	5,100 x 500 x 300	340 x 310	525	37	9,000
B747-200F	490	109	5,100 x 500 x 300	340 x 310	525	37	10,700
B747-400F		113	5,100 x 500 x 300	340 x 310	535	37	n/a
B757-200F		39	3,400 x 330 x 210	340 x 220	190	15	5,800
B767-300F		55	3,900 x 330 x 240	340 x 260	300	17	6,500
DC-10-10F		56	4,100 x 450 x 250	350 x 260	380	23	8,000
DC-10-30F		70	4,100 x 450 x 250	350 x 260	380	23	8,000
IL-76	430	40	2,500 x 330 x 340	330 x 550	180	n/a	2,800
L-100	275	22	1,780 x 310 x 260	300 x 280	120	6	n/a
L-100-20	275	20	1,780 x 310 x 260	300 x 280	120	6	n/a
L-100-30	280	23	1,780 x 310 x 260	300 x 280	120	6	n/a
MD-11F		90	3,800 x 500 x 250	350 x 260	365	26	n/a
B737-300F		16	1,800 x 330 x 210	350 x 230	90	8	7,000

Note: The cargo capacities and cruise speeds listed in the table are averages. Actual capacities will vary based on the altitude, ambient air temperature and actual fuel on board.

J.3 Characteristics of helicopters commonly used during emergencies

Helicopter type	Fuel type	Cruising speed (knots)	Typical allowable payload for hovering in ground effect (kg/lb)	Typical allowable payload for hovering out of ground effect (kg/lb)	Number of passenger seats
Aérospatiale SA 315B Lama	Jet	80	420/925	420/925	4
Aérospatiale SA-316B Allouette III	Jet	80	526/1,160	479/1,055	6
Aérospatiale SA 318C Allouette II	Jet	95	420/926	256/564	4
Aérospatiale AS-332L Super Puma	Jet	120	2,177/4,800	1,769/3,900	26
Bell 204B	Jet	120	599/1,20	417/920	11
Bell 206B-3 Jet Ranger	Jet	97	429/945	324/715	4
Bell 206L Long Ranger	Jet	110	522/1150	431/950	6
Bell 412 Huey	Jet	110	862/1900	862/1,900	13
Bell G-47	Aviation Gas	66	272/600	227/500	1
Bell 47 Soloy	Jet	75	354/780	318/700	2
Boeing H 47 Chinook	Jet	130	12,210/26,918	12,210/26,918	33
Eurocopter (MBB) BO-105 CB	Jet	110	635/1,400	445/980	4

Helicopter type	Fuel type	Cruising speed (knots)	Typical allowable payload for hovering in ground effect (kg/lb)	Typical allowable payload for hovering out of ground effect (kg/lb)	Number of passenger seats
Eurocopter BK-117A-4	Jet	120	599/1,320	417/920	11
MI-8	Jet	110	3,000/6,613	3,000/6,613	20-30
Sikorsky S-58T	Jet	90	1,486/3,275	1,168/2,575	12-18
Sikorsky S-61N	Jet	120	2,005/4,420	2,005/4,420	n/a
Sikorsky S-64 Skycrane	Jet	80	7,439/16,400	7,439/16,400	n/a
Sikorsky S-70 (UH-60) Black Hawk	Jet	145	2,404/5,300	1,814/4,000	14-17

J.4 Aircraft loading and offloading methods

Aircraft may be loaded in four ways:

- **Bulk loaded** – Cargo is loaded on the floor and held in place by nets, straps or ropes. This may increase the usable cargo space on an aircraft; however, securing cargo in place may be more difficult. Bulk loading also slows loading, offloading, sorting, distribution and customs processing.
- **Palletized** – Cargo is preloaded onto wood or metal pallets and held in place by nets, straps or ropes. This method is commonly used to store and ship humanitarian supplies. Military pallets, officially called HCU-6/E or 463L pallets (nicknamed “cookie sheets”), measure 224 cm wide and 274 cm long (213 x 264 of usable space). They are made of wood with a thin aluminium coating and weigh 160 kg (with netting). The loaded pallets can be as heavy as 4500 kg. These pallets are reusable and must be returned.
- **Containerized** – Cargo is preloaded into closed containers and then loaded onto the aircraft. This method is used to load large commercial aircraft such as B747s and DC-10s. Cargo containers come in a great variety of shapes and sizes and their maximum loaded weights range from less than 450 kg to over 11 tons. Each type is designed to be loaded and offloaded with cargo in place using a mechanised loading system

They are commonly used on aircraft such as the C-5, C-17, C-141 and C-130. Some commercial aircraft also use them. For logistical planning purposes, when building pallets, limit the height of a stack to 243 cm (96 inches) for these aircraft unless authorised to stack higher by the crew chief. The size of commercial pallets varies greatly depending on the country or region and the intended use. They are generally wood but may also be metal or plastic. They are used on aircraft such as the DC-8, B727, DC-10 and B747. These pallets are also reusable. It is possible to stack pallets on an aircraft, but it is more difficult and very time-consuming. Remember, flight crew duty time is ticking!

or a forklift. Containerizing is very difficult and time-consuming, and sometimes it is impossible to hand-load or unload containers once they are on the aircraft. If a forklift will be used to load or offload containers or pallets, make sure that the forklift can carry the largest pallet, has tines long enough to counterbalance the weight and that the highest point of the forklift is lower than that portion of the aircraft (wing, tail or door in open position) where it must move to retrieve the container or pallet.

- **External (helicopters only)** – Cargo is placed in a net or suspended from a line and picked up and moved by the helicopter using a belly hook.

Helicopters normally lift and move more cargo externally (slinging) than internally. The external cargo is loaded into specially made nets that are connected to a cargo hook on the belly of the helicopter. Cargo may also be suspended on cables (lead lines). Make sure lead lines and nets are approved for slinging cargo.

Pallets, containers, nets and lead lines are reusable. They may also need to be returned quickly to their point of origin, so they can be used for loading more cargo. Always think in terms of 'back hauling' cargo equipment for reuse or when it is no longer needed.

J.5 Phonetic alphabet, standard UN call signs and radio prowords

Letter	Pronunciation	Letter	Pronunciation	Letter	Pronunciation
A	ALPHA	J	JULIET	S	SIERRA
B	BRAVO	K	KILO	T	TANGO
C	CHARLIE	L	LIMA	U	UNIFORM
D	DELTA	M	MIKE	V	VICTOR
E	ECHO	N	NOVEMBER	W	WHISKY
F	FOXTROT	O	OSCAR	X	X-RAY
G	GOLF	P	PAPA	Y	YANKEE
H	HOTEL	Q	QUEBEC	Z	ZULU
I	INDIA	R	ROMEO		

Within the UN call sign system, the first letter indicates the location of the network. The first letter of the location name is usually designated. If this letter is already in use by another network within the country, the last letter is used. This continues until an available letter is found in the location name. For

example, a network operating in Pakistan would use Mike for Multan and Delta for Muzaffarabad.

Standard UN call signs

The second letter of a call-sign indicates the agency:

Letter	Pronunciation	Letter	Pronunciation
Alpha	FAO	November	UNFPA
Bravo	World Bank/IMF	Oscar	OCHA/UNDAC
Charlie	UNICEF	Papa	UNOPS
Delta	UNDP	Quebec	UNDPKO
Echo	UNESCO	Romeo	UNHCR
Foxtrot	WFP	Sierra	UNDSS
Golf		Tango	UNHABITAT

Letter	Pronunciation	Letter	Pronunciation
Hotel	WHO	Uniform	UN Secretariat
India		Victor	
Juliet		Whisky	
Kilo		X-ray	Reserved for NGOs
Lima	UNJLC	Yankee	Reserved for NGOs
Mike	IOM	Zulu	Reserved for NGOs

The first digit of the call sign indicates the position within the agency:

#	Department	#	Department
1	Management and miscellaneous senior staff	6	Agency-specific
2	Finance / Administration	7	Drivers
3	Logistics	8	Technical support staff, e.g. Telecom, IT, etc.
4	Programme	9	Visitors / Agency-specific
5	Staff security / guards		

The last one or two digits indicate the different individuals in the department. For example, the UNDAC Team Leader in Muzaffarabad would be Delta-Oscar-1; the UNDAC Deputy Team Leader would be Delta-Oscar-1-1.

Radio prowords

Proword	Meaning
ACKNOWLEDGE	Confirm that you have received my message and will comply.
AFFIRMATIVE – NEGATIVE	Yes/Correct - No/Incorrect.
ALL AFTER or ALL BEFORE	Everything that you (I) transmitted after... (Keyword). Everything that you (I) transmitted before... (Keyword).
CORRECT (THAT IS CORRECT)	What you have transmitted is correct.
CORRECTION	An error has been made in this transmission. It will continue with the last word (group) correctly transmitted. An error has been made in this transmission. Correct version is... That which follows is a correct version in answer to your request for verification.
WRONG	Your last transmission was incorrect. The correct version is...
SILENCE – SILENCE – SILENCE	Cease all transmissions on this net immediately. Will be maintained until lifted.
SILENCE LIFTED	Silence is lifted. The net is free for traffic.
END OF MESSAGE – OVER (OUT)	This concludes the message just transmitted (and the message instructions pertaining to a formal message).
FIGURES	Numerals or numbers will follow. In general, numbers are transmitted digit by digit except that exact multiples of hundreds and thousands are spoken as such.
OVER	This is the end of my turn of transmitting. A message is expected. Go ahead.
THROUGH ME	I am in contact with the station you are calling; I can act as a relay station.
MESSAGE PASSED TO	Your message has been passed to...
ROGER	I have received your last transmission satisfactorily.
ROGER SO FAR?	Have you received this part of my message satisfactorily?
WILCO	I have received your message, understand it, and will comply. (To be used only by the addressee.) ROGER and WILCO are never used together.
UNKNOWN STATION	The identity of the station calling or with whom I am attempting to establish communication is unknown.

Proword	Meaning
WAIT (WAIT-WAIT)	I must pause for a few seconds.
WAIT – OUT	I must pause longer than some seconds and will call you again when ready.
OUT	This is the end of my transmission to you. No answer or acknowledgement is expected.
OUT TO YOU	Do not answer; I have nothing more for you. I shall now call another station on the net.
READ BACK	Repeat the entire following transmission back to me exactly as received.
I READ BACK	The following is my reply to your request to read back.
SAY AGAIN	Repeat all of your last transmission. Followed by ALL AFTER, ALL BEFORE, WORD AFTER, WORD BEFORE etc. means: Repeat... (portion indicated).
I SAY AGAIN	I am repeating my transmission or portion indicated.
SEND	Go ahead with your transmission.
SEND YOUR MESSAGE	Go ahead, transmit; I am ready to copy.
SPEAK SLOWER	Reduce the speed of your transmission.
I SPELL	I shall spell the next word, group or equivalent phonetically. (Not used when transmitting coded groups only.)

J.6 Personal preparedness checklist

Before deploying on a UNDAC mission, members are required to ensure their personal preparedness and readiness for mobilisation. This involves meticulous planning and arrangements to address both personal and professional responsibilities and considerations.

J.6.1 Overall readiness

- **Personal arrangements** – Ensure family is prepared for a possible sudden departure on mission, organise care arrangements for dependents, manage personal affairs, including
 - » A will and a power of attorney or other legal instruments to regulate your daily affairs in your absence.
 - » Payment of pending bills and cancelling/re-scheduling of appointments for the expected mission period.
 - » Life insurance, disability insurance, personal belongings insurance.
- **Professional arrangements** – Secure rapid employment release and maintenance of salary and benefits, and make necessary agreements with the national UNDAC focal point (e.g., agreements, insurances, funding arrangements) as applicable.
- **Training and exercises** – Participate in relevant training and exercises to enhance personal preparedness, e.g., various OCHA or other courses where UNDAC members are offered slots.
- **UNDAC documentation and contacts** – Ensuring validity of UNDAC contract and medical certificate, and maintaining updated contact and personal information on the **VOSOCC**.
- **Mission kit** – Preparing and maintaining UNDAC and personal mission kit, including **valid** travel documents, money (cash in hard currencies, credit cards), prescription medicines, and other essentials.

J.6.2 Travel documentation

- Passport (with at least six months' validity), preferably machine readable, and with at least two blank pages. Carry photocopies and additional passport photos (for issuance of visas on arrival if needed).
- International certificate of vaccinations, with photocopies.
- United Nations Certificate, with photocopies.
- Travel itinerary and electronic ticket (issued by OCHA for national UNDAC members; OCHA staff and staff from other member and partner organisations will do their own travel arrangements).
- Hard copy of Travel Attestation from OCHA (in lieu of visa).
- Emergency contact numbers (OCHA Geneva, in-country and personal).

Note: Carry both printed and electronic copies of essential documents (in cloud space e.g., Dropbox, Google Drive, SharePoint, etc.).

- Arrive early at the airport to handle any departure issues
- Be prepared to explain UNDAC / emergency relief mission to airline staff
- Ensure visa requirements, if any, are understood and met

J.6.3 UNDAC-specific documentation

- UNDAC Handbook, full version (downloaded) or short aide-memoire version.
- Mission-specific country information, including latest situation reports, maps, contact information, etc.
- Hard or electronic copies of latest relevant reference material, e.g., Inter-Agency Standing Committee (IASC), OCHA and other key guidelines.
- Contacts of UNDAC Mission Focal Point and relevant OCHA ERS contact details.
- Verify with OCHA ERS the availability of eSIMs.

J.6.4 Financial preparedness

- Carry cash (preferably small denominations) in local currency or in accepted currency (USD, EUR, or other major international currencies).

- Carry international credit cards (with emergency numbers in case of loss or theft).
- UNDAC Daily Subsistence Allowance (DSA)
 - » DSA covers personal expenditures for UNDAC team members
 - » Available via direct transfer to bank account or, in exceptional cases, through the local UNDP office in local currency. For the latter case, immediately notify OCHA ERS prior to deployment.
 - » Expect potential delay in receiving DSA, particularly in disaster situations.
- » Poliomyelitis (obligatory for some countries, i.e., no entry without a certificate of vaccination)
- » Hepatitis A
- » Hepatitis B
- » Typhoid
- » Rabies
- » Covid-19
- » Other vaccinations according to diseases endemic in the region being visited, e.g., Japanese encephalitis, meningitis ACWY

J.6.5 Medical preparedness

Ensure vaccinations are up-to-date, carry necessary international certification and health record, and carry medical supplies, as follows:

1. **Personal health records** (up-to-date, with any relevant certificates and prescriptions; may be needed by health providers if they fall ill on mission) including:
 - » Blood type
 - » Vaccinations record
 - » Allergies, particularly to food or medication
 - » Records of medical illnesses and medication being used
 - » Recent dental check-up
 - » Health insurance details
 - » Name and contact details of your usual health care provider, e.g., personal doctor or medical specialist
 - » Emergency Contact (family, friends, colleagues) at home
2. **Vaccinations** (recommended and, in some parts of the world, obligatory):
 - » MMR (Measles-Mumps-Rubella: 2 doses are valid for life, normally given in childhood)
 - » Yellow fever (obligatory for some countries, i.e., no entry without a valid certificate of vaccination)
 - » Tetanus, in combination with diphtheria

A number of websites give updated information on requirements and recommendations for each country, e.g., the Center for Disease Control and Prevention (www.cdc.gov/travel) and the World Health Organization (www.who.int). International SOS also has a website (<https://www.internationalsos.com/medical-and-security-services>) and application that provides relevant information.

3. Medical kit with essential supplies to treat minor health illnesses or injuries

Prepared in advance. Check medicine expiry dates periodically. Clearly mark contents, including medication name and proper usage. Use a sturdy waterproof container, with compartments for different needs.

- **Personal prescription medication** as needed. Please note that some countries require prescriptions from doctors or may limit the import of certain types of prescription medicine. Consult the logistics note and/or check with OCHA ERS.
- **Contingency medication:**
 - » Fever, aches, pain, e.g., paracetamol, ibuprofen, aspirin
 - » Sore throat, cough, e.g., lozenges
 - » Runny nose and allergies, e.g., antihistamine
 - » Abdominal upset, e.g., activated charcoal, antacids
 - » Diarrhoea, e.g., Imodium
 - » Oral Rehydration Salts (ORS)
 - » Anti-malarial pills
 - » Malaria is a serious risk on many missions and UNDAC members should establish

procedures for obtaining appropriate prophylaxis, and treatment, on short notice, e.g., through an advance prescription from a doctor. Since no malaria prophylaxis can be fully effective, it is important to take preventive measures, e.g., repellents, insecticide impregnated mosquito net, appropriate protective clothing. Further information and country guidance can be found on health websites as indicated above.

- » Broad-spectrum antibiotics
- » Water purification tablets

4. Skin care:

- » Sun block/sun screen
- » Lip salve
- » Moisturizer
- » Plasters in assorted shapes/sizes
- » Hydrocortisone cream against skin allergies, insect bites, etc.
- » Antiseptic cream for cuts, abrasions, etc.
- » Antiseptic wipes/soap
- » Insect repellent (at least 50% DEET or Icaridin)

5. Others:

- » First-aid kit
- » Bandages
- » Alcohol wipes
- » Medical gloves
- » Disposable medical face masks that comply with preventive standards for safety and efficacy against the spread of viruses

Upon receipt of an UNDAC alert, members should take the following steps:

- Evaluate their state of health. If there are any doubts about existing illnesses, injuries or mental health status, members should not make themselves available for deployment until they have been resolved and should advise OCHA accordingly.
- Check that their individual medical kit is prepared and packed, including any prescription medication or supplies that may not be available in the deployment location.

- Pack spare health articles such as glasses, contact lenses, etc., and any associated requirements.
- Include individual health documentation in their hand luggage, including vaccination certificates and personal health data.
- Check the health threats and requirements in the deployment location, update their medical kit as appropriate and commence any prophylactic treatment necessary.

Chapter I. on Personal Health includes additional information related to staying healthy on mission.

J.6.6 Personal equipment & luggage

Overall...

- New members receive a standard mission kit, including:
- Pack according to location/culture, climate, and disaster type.
- Ensure readiness with a diverse range of clothing and equipment.
- Pack light and smart, be able to personally carry everything by themselves.
- Supplement kit based on personal preferences.
- Include food for the initial 72 hours and water for the first 24 hours. (A contingency plan for obtaining food and water on location is important.)
- Carry at least two changes of appropriate clothing (appropriate for the disaster type, location/culture, climate/elevation and expected duration of the mission; quick-dry clothing is recommended as it enables you to travel light and wash your own clothes).
- Include sturdy walking boots (2 pairs) and business attire for meetings with local officials.

In detail...

- Backpack or hold-all (as carry-on luggage)
- A personal tent for accommodation may be needed, but it should be clarified with OCHA before departure if this will be supplied by operational support partners or through other arrangements.
- Rain gear, jacket and trousers that fold up small, and appropriate all-weather footwear.

- Sleeping bag with silk or cotton liner
 - Travel pillow/case
 - Field mattress
 - Waist pouch or money belt, for documents and money
 - Hat and/or other headgear (for sun or warmth as appropriate)
 - Lightweight stove and one litre bottle for fuel (empty for air transport)
 - Mug, plate, cooking set and eating utensils.
 - Water bottle with purification filter and large opening for better cleaning
 - Dry food - for the first 72 hours in case of lack of alternatives. Check online 'food for trekking' as examples of high energy, lightweight and compact food rations
 - Toiletries, including a towel, toothbrush/paste with a snap-on case to keep it clean, wet-wipes, deodorant, soap or all-in-one body wash – travel-sized and airport-security friendly (under 100ml); liquid soap in a separate plastic bag in case of leakage during travel
 - Menstrual hygiene products, if applicable
 - Anti-bacterial gel or liquid for hand cleaning
 - Roll of toilet paper, crushed to fit in suitcase, or Kleenex tissues ('wetties')
 - Earplugs and facemask, with spares
 - Extra glasses and an ample supply of contact lenses, if required
 - Two pairs of sunglasses
 - Headlamp, torch/flashlight with spare bulb (or LED) and batteries
 - Pocket knife/multi-tool, Swiss Army knife, Leatherman, etc. (not in hand luggage)
 - Sewing kit (not in hand luggage)
 - Ball of string
 - Duct tape
 - Plastic bags
 - Matches and candles
 - Pencil and notebook
 - Laptop (See also **Section H.4.2.3** for advice on using personal laptops)
 - Chargers for personal equipment, universal adapters for electrical appliances
 - USB memory sticks
 - Mobile phone with possibility for using locally bought SIM cards
 - Smartphone with camera and web interface for messaging apps and other online services, preloaded with standard apps, e.g., UNDAC Handbook, INSARAG Guidelines, KoBo Toolbox, Signal messaging app, etc. (See also **Section H.4.1.1** for advice on use of personal phone and locally bought SIM-cards.)
 - Extra battery pack/power bank for your phone
- For (travel to) warmer climates, consider:
- Mosquito net
 - Mosquito repellent
 - Cool boots/shoes
- For cold climates, consider:
- Woollen hat
 - Windproof jacket
 - Fleece jacket
 - Woollen sweater
 - Warm boots (water-resistant)
 - Woollen socks, gloves or mittens, scarf or buff-type head and neckwear, woollen or thermal underwear
- The following may also be helpful:
- Compass/GPS
 - Alarm clock
 - Pocket-size binoculars
 - Identification tags ('dog tags') with name, nationality and blood type
 - Books and magazines – e-readers are good options as they take less space
 - Downloaded music and movies
- Tips for packing & traveling:**
- Your travel allowance is based on your ticket. If you have excess luggage, you can seek reimbursement by submitting your Expense Report to the OCHA ERS Administrative Focal Point upon return from the mission. In the case of excess baggage, please ensure you have a receipt clearly stating that you paid for an additional piece of

luggage. (Refer to **Chapter C**, Post-Mission, for administrative details).

- Pack essential items in hand luggage for immediate use upon arrival.
- Maximise use of hand luggage entitlements and respect the latest international air travel regulations regarding forbidden objects in hand luggage.
- Allow ample time for security checks at transit points.
- In cases where team members may have onward internal flights to reach the disaster site(s), consider reduced luggage allowances for onward internal flights in terms of packing and in choice of luggage. The likelihood of checked luggage being lost is significant, so ensure that all essentials are packed in the carry-on luggage.
- Organise luggage to facilitate reorganisation if needed for internal flights.

J.6.7 Cultural sensitivity and adaptation

Cultural, political, social, and religious considerations may influence how the team approaches its mission objectives and must be taken into consideration by individual team members to ensure adaptation to local customs and avoid offending or alienating local counterparts.

- Research cultural norms before deployment, e.g., travel advice from their home country's Foreign Office,
- Seek briefings on customs and traditions upon arrival (e.g. from local staff).
- Respect local dress codes, such as mandatory headscarves for women.
- Avoid attire like short sleeves and shorts for business interactions.
- Be mindful of prohibited food and alcohol consumption.
- Respect local meeting management, hierarchies, and customs for mission success.

J.6.8 En route

- Prioritise rest during travel to maintain readiness upon arrival.

- Inform OCHA ERS promptly in case of any unforeseen issues like missed flight connections.

J.6.9 Climates

UNDAC missions can occur in a variety of climates around the world. While many responses occur in urbanised temperate areas that generally do not require special safety or survival knowledge beyond that included in other parts of this Handbook, UNDAC members should be aware of special considerations when operating in specific environments that pose unique survival challenges. This section provides some advice and tips for operating in different climates, but is not meant to replace the individual pre-mission research that should be completed by each team member.

J.6.9.1 Cold climates

The following sections provide advice and tips for operating in cold climates but are also applicable if experiencing unusually low temperatures in any part of the world.

Clothing

It is often said that 'there is no such thing as bad weather, only unsuitable clothing'. All cold conditions, from extreme polar climates to some degrees above freezing, can be easily handled with appropriate clothing. The following advice applies.

- Several layers of clothing are better than one heavy layer. Dress in at least three layers: an inner layer closest to the body, a mid-layer for insulation, and an outside layer that prevents body heat from escaping.
- Under layers should trap air for insulation. Wool is best for undergarments and is warm even when wet. Avoid cotton as it absorbs moisture and rapidly causes heat-loss when wet.
- The outer layer should be of a breathable material. It should be windproof but not waterproof (which could trap vapour inside). Waterproof clothing should only be used in rain and when properly ventilated.
- Cover every part of the body, and especially the head which is the most vulnerable to heat loss.

Wear a woollen hat at all times and cover it with a drawstring hood if needed.

- Add a scarf or buff, preferably of wool, around the neck to keep the throat and main arteries warm.
- Use mittens, not gloves. Mittens allow body-heat to circulate around the hand while gloves isolate the fingers which have very little blood circulation and easily get cold.
- A fur-type trim attached to the hood of a jacket prevents breath from freezing on the face and injuring the skin. If clothing has no drawstring, tie sleeves above the cuffs, use mittens with high cuffs and tuck trousers into boots to prevent heat escaping.
- Wear several pairs of socks, preferably wool, graded in size to fit over each other and not wrinkle. The foot should not be tight inside the boot as that will prevent circulation of warm air.
- For footwear, use insulated, waterproof, e.g., Gore-Tex or similar, or leather boots with rubber soles and a lining.
- Wear loose clothing and allow body-heat to circulate. If sweating, ventilate by opening zippers and fasteners, loosening the collar and cuffs or removing a layer. Moisture from sweat conducts cold and dry air insulates. Keep dry – keep warm!

Shelter

- Availability of Suitable Accommodation:
 - » Confirm whether UNDAC operational support partners, like the International Humanitarian Partnership (IHP), provide tented accommodation suitable for the climate.
 - » Determine if specialised staff will pitch and maintain tents, or if it will be your responsibility.
 - » Be prepared to pitch and maintain tents if not supported by specialised staff.
- Use of Heating Source:
 - » Assess if an external heating source is needed inside the tent.
 - » Be aware of the fire risk associated with using a heating source inside a tent.
- Safety Measures:
 - » Recognize that tent material is highly flammable.
 - » Keep any heat sources away from the sides of the tent to prevent fire hazards.
 - » If using a heat source with open flames, keep the tent door open in case of emergency.
- Snow and Rain Management:
 - » Shake off as much water as possible from clothes and boots before entering the tent in snowy or rainy weather to keep the interior dry.
 - » Brush off dry snow outside the tent before it thaws to prevent moisture build-up inside.
- Sleeping Bag Use:
 - » Remove outer garments (except the woollen hat) when inside a sleeping bag.
 - » Avoid wearing shoes inside the sleeping bag to retain body heat and create a comfortable temperature inside.
 - » Understand that proper insulation inside a sleeping bag may eliminate the need to heat the tent in most cases.

Health concerns

Cold climates may carry a number of health risks which can be managed:

- Frostbite and hypothermia are the main hazards in cold climates. See Reference material J.8 for how to treat them should they occur.
- Efforts to exclude draughts in shelters may lead to lack of oxygen or carbon monoxide poisoning. Some ventilation is essential.
- Thinking may become sluggish. Keep alert and active but avoid fatigue and conserve energy for useful tasks. Sleep as much as possible. Unless you are so exhausted that you cannot regenerate heat, you will not freeze in your sleep.
- Exercise fingers and toes to improve circulation. Take precautions against frostbite. Mittens are better than gloves.
- Avoid spilling petrol on bare flesh as it will freeze at once and damage the skin.
- Don't put off defecation; this can cause constipation. Time it conveniently, before leaving the shelter, and dispose of waste appropriately.

- Core temperature (body and head) is vital. When the body freezes it extracts blood from the limbs to warm the core. The head is where the human body loses the most heat when exposed to low temperatures. Remember the old saying: if your toes freeze - cover your head!
- Eat and drink more than usual as the body uses more energy in cold climates. Food should be rich in fat and protein to restore calories that burn off more rapidly as the body works to keep warm.

J.6.9.2 High altitudes

It is possible that UNDAC missions may be conducted at altitudes over 2500m, i.e., a high-altitude region. In addition to the advice for cold climates given above, missions in this context are connected with the possible risk factor of altitude sickness. Even rescue dogs can be affected.

Considerations for Altitude:

- Understand Altitude Sickness:
 - » Be aware that altitude sickness can develop in individuals acclimated to high altitudes due to factors such as ascent rate, starting altitude, or individual susceptibility.
 - » Altitude sickness results from a lack of physiological adaptation to reduced atmospheric oxygen levels.
- Prevention Methods:
 - » Recognize that gradual ascent of no more than 600m per day is considered the best prevention method for altitude sickness.
 - » Acknowledge that immediate deployment in disaster response missions may not allow for gradual ascent, necessitating careful consideration.
 - » Understand that chemoprophylaxis (medication) is not 100% effective against altitude sickness. Therefore, deployment to high altitudes needs to be carefully considered.
- Careful Deployment Consideration:
 - » Evaluate the feasibility and potential risks associated with deployment to high-altitude areas.
- » Ensure thorough planning and risk assessment before undertaking missions in high-altitude regions.

Altitude sickness comprises several possible medical conditions that may develop at high altitudes, such as:

- **Acute Mountain Sickness (AMS)** – A throbbing frontal headache that is aggravated by exertion. It is the most common ailment, particularly in the morning. Other symptoms include malaise, lassitude, disinclination to work, loss of appetite, nausea, vomiting, shortness of breath on exertion and disturbed sleep.
- **High-Altitude Pulmonary Oedema (HAPE)** – Can result from untreated AMS. It is caused primarily by rapid ascent, cold and exertion. It is potentially life-threatening, beginning with a headache, then body ache, cough and breathlessness on exertion (which is progressive), non-anginal chest pain, lack of appetite, disturbed sleep, vomiting and giddiness. At times, a fever may be the presenting symptom.
- **High-Altitude Cerebral Oedema (HACE)** – The most dreaded but also the least common of high-altitude sicknesses. The onset is as with AMS and the alteration of consciousness is the most important feature. Vision loss or changes, dizziness and vomiting may progress to stupor and coma.

In case of any of the above-mentioned symptoms in a high-altitude setting, immediately seek medical attention and consider that descent might be necessary.

J.6.9.3 Tropical climates

This section deals with missions to tropical climates, characterised by high temperatures and high humidity. In these climates everything thrives, including disease and parasites. Except at high altitudes, equatorial and subtropical regions are subject to high temperatures, heavy rainfall and oppressive humidity. Violent storms may also occur.

Clothing

- Dress light but stay covered to avoid insect bites and stings. Clothes should be loose fitting, clean and dry; cotton or linen is usually best as

it offers good ventilation. Clothes impregnated with insect repellent are very effective against bites. Good footwear and protection for the legs is essential.

- Keep clothing and footwear off the ground when not wearing so that scorpions, snakes and spiders don't creep in. Shake out clothes and check shoes and boots before putting them on. Be wary when putting hands in pockets.

Shelter

- Shade, ventilation and protection from insects are important shelter considerations in tropical climates. Shelters and tents exposed to the sun should have a double-layered roof with airspace 20-30 cm between to aid cooling. Double layers of cloth will help keep out rain if angled. In choosing camp sites make sure you are above potential flooding. Sleep on a raised bed to allow air to circulate.

Health concerns

- Serious diseases may be contracted in tropical climates, through eating contaminated food, drinking impure water or from insect bites, and appropriate precautions must be taken. In malaria-risk countries, protection against insect bites, use of mosquito nets and malaria prophylaxis is essential.
- The WHO website on International Travel and Health (<http://www.who.int/ith/en/>) provides up-to-date information on health risks by country. See also **Chapter J** for health advice on mission and the section on medical preparedness above.
- In tropical climates, sanitation and personal hygiene become more important. Each UNDAC member should take special care of their own cleanliness and that of their surroundings. Bathe regularly and carry out frequent inspections of the body. Scratches and wounds should be attended to at an early stage to avoid them turning septic. Dusting with foot powder will help prevent fungal diseases, such as ringworm and athlete's foot.

J.6.9.4 Desert climate

Deserts are vast, arid areas with little vegetation and generally sparsely populated. The average

rainfall is very low and long spells of drought are frequent. Desert climate is generally associated with extreme temperatures which can range between 45°C and nearly freezing. Due to its scarcity, water assumes significance in logistics planning, and storage and transportation are prerequisites for operations.

Clothing

- Choose light and loose-fitting garments.
- Ensure there is air space between clothing and the body for ventilation.
- Select clothing that helps reduce fluid loss, provides protection from sunburn and insect bites, and offers warmth at night.
- Cover legs to protect from sun exposure and potential hazards.
- Wear suitable footwear to prevent burning and blistering of the feet.
- Cover the head and neck, as these areas are particularly susceptible to sun exposure.
- Wear sunglasses to protect the eyes from harmful UV rays.
- Prepare for dust or sandstorms by having additional protection for the eyes and mouth.
- Consider using goggles or a face mask to shield the eyes and mouth from sand and dust particles.

Health concerns

Most desert illnesses are caused by excessive exposure to sun and heat. Following the advice above will help. Additional health considerations are as follows:

- Constipation and pain in passing urine are common and salt deficiency may lead to cramps.
- Heavy sweating, coupled with garments that rub against the skin, may block the sweat glands and result in an uncomfortable skin irritation known as prickly heat.
- Heat cramps, heat exhaustion, heat stroke and serious sunburn are all risks in the desert. A gradual increase in activity and daily exposure to the sun will build up a defence, provided that plenty of drinking water is available.

- Keep the moist areas of the body clean and dry to prevent infection, i.e., crevices of armpits, the groin and toes.
- Even the most trivial sore can become infected if not dealt with straight away. Pull out any thorns as soon as possible to avoid painful sores that may develop and prevent walking. Bandage all cuts with clean dressings and use what medical aids are available.

J.7 Comprehensive health and safety guidelines for environmental emergencies

Next to Checklist on Personal Preparedness and the Chapter on Personal Health, please find some guidance below on Personal Protection Equipment (PPE), CBRN hazards, and decontamination.

J.7.1 Personal Protection Equipment (PPE)

PPE is indispensable for ensuring safety in hazardous work environments. It includes hard hats, safety glasses, gloves, hearing protection, and respirators, all tailored to specific risks.

While donning a CBRN Suit is relatively easy, safely removing it without contaminating one's surroundings requires meticulous organisation and measurement by a CBRN Spec/Hazmat expert.

Additionally, it is advisable to have a flashlight installed in a helmet and apply sunscreen for prolonged outdoor activities. Ensure that local staff have equivalent protection.

Maintaining contact with OCHA ERS and/or the UN-DAC Team Leader and utilising tracking devices like Garmin InReach GPS or satellite radio. Do regular checks on emergency connections and ensure strategic parking of rescue vehicles for swift response.

J.7.2 CBRN Hazards

It is essential to refrain from entering CBRN events without a Hazmat/CBRN Specialist and adequate

equipment for every team member. Protective equipment such as masks, suits, and gas protection is mandatory. Additionally, it is crucial to have a CBRN/Hazmat specialist present to measure before, during, and after entering dangerous zones. They can advise on protective levels, decontamination procedures, ensure safety, identify emergency exits, and provide first aid in case of contaminations alongside a paramedic.

Understanding the 4 CKs (C. Kaupp factors) in advance can make handling a CBRN incident easier:

- Proper identification of the substances/mixes involved.
- Safe estimation of the volume, mass, and mobility in different phases like air, groundwater, and soil.
- Reliable indication of human and environmental toxicity (e.g., IDLH from OSHA/NIOSH, US EPA).
- Avoid exacerbating the situation; always consider the potential outcomes of your actions or inactions.

Chemical hazards

The most common hazards in JEU operations dealing with environmental emergencies are likely to include the following substances:

- Release of asbestos,
- Petrochemicals (fuels such as diesel, petrol, heavy fuel oil),
- Technical industrial chemicals (TIC's) such as acids and alkalis, solvents, monomers,
- Agrochemicals such as fertilisers (ammonium nitrates), pesticides (organophosphorus compounds/nerve toxins),
- Gases from burst pipes and containers,
- Building material components such as debris, cements,
- Small and household chemicals like cleaning agents and disinfectants.

Without an equipped Hazmat/CBRN specialist, at least one 4-channel device must be carried in the event of an environmental disaster (e.g., MSA Altair with oxygen, CO, H₂S and EX). These devices must be maintained and calibrated.

Without a suitable detecting device, access to debris areas, rubble and subterranean structures is not recommended without a JEU Hazmat/CBRN Specialist. Without knowledge of the specific chemicals involved, proper PPE selection is challenging. If the chemical is known, information on the correct PPE can be found in the respective safety data sheet (i.e., a document containing details pertaining to occupational safety and health regarding the utilisation of different substances and products). Consult the Hazmat/CBRN Spec if no information is available before entering a zone.

- **Remark regarding asbestos:** After an earthquake, significant amounts of asbestos can be released. Despite using a proper black/white system and protective equipment, there may still be intake that could potentially impact health. Hence, it is preferable for UN JEU members older than 50 years to be on such missions. Additionally, every member must be informed about the potential danger of “the silent death” caused by asbestos.
- **Remark regarding chemical warfare agent (CWA), ammunition, explosives, or Toxic Industrial Materials (TICs):** If the situation indicates a risk of the presence of CWA (chemical warfare agent), ammunition, explosives, or TIC’s (Toxic Industrial Materials) such as ammonia or organic phosphoric acid esters (pesticides), specialised assistance from skilled HAZMAT and/or EOD (Explosive Ordnance Disposal) personnel is necessary.

Biohazard

Biohazards proliferate rapidly under optimal conditions. An outbreak is to be monitored via the UN network, the national population health organisation or NGOs.

Personal Protective Equipment (PPE) Kit recommended includes:

- Malaria prophylaxis and cholera prophylaxis/swallowable vaccine.
- Diarrhea medication and salt for fluid replacement.
- Gloves, FFP2/FFP3 masks, and hand sanitizer suitable for aircraft use.

- Protective suits (e.g., PP-Overall) for comprehensive bodily protection.
- Virkon S for chemical disinfection.

Nuclear and Radiation spills

Radiation is easily detectable. Therefore, entry into radiation-affected zones should not occur without measurement equipment, air protection, and a decontamination plan following a calculated exposure time. It is important to note that ordinary clothing does not shield against gamma radiation; it primarily protects against active dust particles.

When conducting decontamination procedures, ensure that water used for the process is collected and filtered. Additionally, avoid performing these procedures near your base. Instead, decontamination should be completed before entering safe spaces like vehicles. Dosimeters should remain worn by team members until the mission’s conclusion, with daily reporting to the hazmat team and medical personnel.

It is advisable for at least one team member, ideally all, to wear an alarm dosimeter continuously until hazmat personnel can confirm the absence of any ionising radiation sources.

J.7.3 Personal hygiene/ decontamination after debris operations

Shoes and clothing inevitably become contaminated after daily activities. Therefore, it is advisable to conduct a **preliminary decontamination by blowing and brushing** before entering vehicles or returning to accommodation. Where feasible, it is important to adhere to the social norms of the deployment country. When dealing with chemicals like asbestos, continue wearing a face-covering mask (FFP2/3) until the decontamination process is complete, especially if using pressurised air or brushes.

Emergency clothing should be stored separately from clean garments in boxes rather than bags to prevent leakage of contaminants. When removing chemicals from clothes or skin, start by using dry paper, such as toilet paper, before proceeding with

water. Notably, asbestos dust easily adheres to surfaces like hair, so wearing headgear and washing hair daily can help prevent contamination, (which is a particularly good alternative to military-style short haircuts).

Always follow the instructions provided by the Hazmat/CBRN Specialist for proper decontamination procedures.

J.8 Medical emergencies and first aid

This section contains very basic information on medical emergencies and first aid. Most field medical situations encountered are not immediately life-threatening. The few that are can generally be addressed by anyone with basic first aid skills and a rational approach that includes a calm and thoughtful manner. Panic may cause or contribute to a 'shock' response in the patient and cause others to act irrationally as well. When confronted by a medical emergency, the first step is to determine whether assistance can be safely and effectively provided. Do not move the patient unless essential – either for your safety or that of the patient.

The instructions below are not intended to be a replacement for first aid training. All UNDAC members are encouraged to obtain and maintain certification in first aid and cardiopulmonary resuscitation (CPR). Take steps, known as 'standard precautions', to protect yourself before attempting to treat the patient. Use surgical gloves if available. It is also strongly advised to use a barrier device for CPR if giving mouth-to-mouth resuscitation.

The initial ABCs of medical emergencies/first aid

The basic steps in assessing the patient and initiating treatment are as follows:

- **Airways** – Open and maintain an adequate airway.
- **Breathing** – Check for breathing by listening at the mouth and watching the rise of the chest.
- **Circulation** – Check for circulation by feeling for a pulse at the wrist, ankle or throat.

Choking and cardiopulmonary resuscitation (CPR)

The patient will be unable to speak or breathe effectively if their airway is obstructed. If they are coughing or gasping strongly for air, only monitor as coughing is a clear sign that they are getting air. If they are unable to speak, trying to clear their throat or coughing weakly, stay with them and carefully monitor their breathing. If the patient is unable to speak and puts their hands around their throat, act promptly as this is the universal sign for choking.

Clearing the airway is easiest if the patient is standing. Step behind them, make a fist with one hand and place it over the abdomen, thumb side towards the patient, between their navel and the bottom of their rib cage. With your other hand, grasp your wrist. With a sharp inward and upward thrust, compress the abdomen. Repeat until the airway is clear.

In a fully unconscious person, if professional help is not available, the airway can be cleared using a 'finger sweep' by reaching into the back of the throat to remove a visible object, being careful not to push the object in further. If unable to clear the blockage but the patient has not resumed breathing, perform CPR as follows:

- **Position the patient** – Lay the patient on their back. Kneel and position yourself at a right angle to the patient's body, with your knees perpendicular to the patient's neck and shoulders.
- **Head tilt/chin lift** – Position your palm on the person's forehead and gently push backward, placing the second and third fingers of your other hand along the side of their jaw, tilting the head and lifting the chin forward to open the airway.
- **Modified jaw thrust** – If you suspect a neck injury, a modified jaw thrust (without the head tilt) may be used. This is done by placing your hands on each side of the patient's face, your thumbs on the cheekbones (but not pushing) and pulling the jaw forward with your index fingers. Again, examine the mouth for foreign objects. If you find any, use the finger sweep to clear them.
- **Check for breathing again** – Put your ear directly over the patient's mouth to listen and feel for air being exhaled. Look at the patient's chest to see if it is rising or falling.
- **Mouth-to-mouth resuscitation** – Position yourself at a right angle to the patient's shoulder. Use

the head tilt/chin lift manoeuvre and pinch the patient's nose closed using your thumb and forefinger. Open your mouth wide and place it tightly over the patient's mouth. Exhale into the patient just enough to see the chest rise. Take another breath and repeat. Check to see if the patient's chest is rising when you exhale. If the stomach bulges the air is going into the stomach and not the lungs. The airway may still be blocked. Check the airway again.

- **Check for a pulse** – After you have delivered two breaths into the patient, check for a pulse using two fingers just to the side of the throat. If the patient has a pulse, but is not breathing, continue mouth-to-mouth resuscitation, using the same technique of big breaths followed by chest compressions. Remove your mouth between breaths. Continue to check for signs of breathing and watch for chest movement. If the patient's breathing is weak, you may have to continue mouth-to-mouth, following the patient's breathing pattern, ensuring a breath at least every five seconds.
- **Alternate chest compressions (to restore blood flow) and breathing** – If you are unable to find a pulse in the patient, you must begin heart compressions to restore circulation. The compressions must be coordinated with the mouth-to-mouth resuscitation.
 - » Kneel and position yourself at a right angle to the patient's chest.
 - » Find the base of the breastbone at the centre of the chest where the ribs form a V. Position the heel of one hand on the chest immediately above the V. With the other hand, grasp the first hand from above, intertwining the fingers.
 - » Shift your weight forward and upward so that your shoulders are over your hands; straighten your arms and lock your elbows. Shift your weight onto your hands to depress the patient's chest (2.5 to 5 cm in an adult).
 - » Pump the patient's chest 30 times and then breathe for them twice. Count aloud as you do it, slightly faster than one compression per second (80-100 beats per minute). Thirty chest compressions followed by two rescue breaths is considered one cycle.
- » Be careful not to provide too many breaths or to breathe with too much force. Remove your mouth between breaths and take sideways breaths of air to inhale fresh oxygen yourself.
- » Check the pulse and breathing after four cycles.
- » Continue with alternating 30 chest compressions and 2x breathing,
- » Continue until help arrives, if possible.
- As soon as an **automated external defibrillator (AED)** is available, apply it and follow the prompts. Give one shock, then continue chest compressions for two more minutes before giving a second shock. If you are not trained to use an AED, an emergency medical operator may be able to give you instructions. If an AED is not available, continue alternating chest compressions and breathing.
- **Performing CPR on a child** – The procedure is essentially the same, but you use only one hand for chest compressions and pump the child's chest five times. You then breathe for the child once, more gently than you breathe for an adult.
- **Two-person CPR** – One person provides breathing assistance while the other pumps the heart. Pump the heart at a rate of 80 to 100 beats per minute. After each 30 compressions, a pause in pumping is allowed for 2 breaths to be given by the other person.

Shock

The most commonly encountered form of shock in the field is traumatic shock, induced by injury. If left untreated, it may result in death. The patient may be cold and clammy, have pale skin, a rapid weak pulse, rapid shallow breathing or a combination of these symptoms. Except in cases of head injury, have the patient lie flat on their back and elevate their legs. Cover them with a blanket or other thermal cover and monitor their ABCs, i.e. Airway, Breathing, Circulation/Compression (see <https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.110.970889>). Always monitor for signs of shock and routinely treat it in cases of severe injury. In this case, cover them with a blanket or other thermal cover and monitor their ABCs.

Bleeding

There are several ways to control bleeding. These should be attempted, in the following order:

- Using sterile gauze, apply pressure directly over the wound. When the bleeding stops, tape or otherwise secure the gauze in place. Immediately removing the gauze may cause the bleeding to restart.
- If you have knowledge of the arterial pressure points, apply pressure using one or both thumbs over the artery. Once this has controlled the bleeding, apply pressure bandages to the wound site.
- If the wound is bleeding heavily, e.g., a gunshot-wound, push several sterile gauzes or pieces of bandage inside the wound using a finger. Remember the number of gauzes put inside the wound so the same number can be safely removed during later treatment and not cause infection.
- If unable to control the bleeding in any other way and professional help is many hours away, apply a tourniquet to the affected extremity. There is a high risk of losing the extremity, particularly if professional attention is not immediately available. This is a last resort.
- Bleeding from the torso does not lend itself to control by any method other than direct pressure to the wound. Elevation may help and if ice is available in sufficient quantity, it will also help.
- Bleeding from the head can usually be controlled by direct pressure, elevation, icing, or a combination of all three. Do not apply a tourniquet.

Burns

Burns may be of three basic types: chemical, electrical, and thermal. The treatment for each is different, but in every case treatment for traumatic shock should be part of the approach.

Chemical burns

These may arise from inadvertent spills when handling chemicals, coming into contact with improperly disposed of chemicals and chemical waste, or from chemical warfare agents. To decrease risk of exposure, responders should have access to information on industrial facilities in the area, be

observant of their surroundings (containers, tanks, fuel stations, storage) and associated risks, know the location of nearby hospitals and treatment facilities, have access to personal protective equipment and not hesitate to request advice from local authorities or health service providers.

Do not approach damaged facilities or touch unknown chemicals without the appropriate expertise and personal protective equipment (gloves, suits, boots, mask, etc.). Always request advice from fire or health services on different types of protective equipment and how to use it.

If exposed to chemicals, take the following steps:

- Remove contaminated clothing and isolate it by placing it in a closable container, e.g., a large plastic bag. Avoid pulling clothing over your head – cut the clothes off if necessary.
- Wash yourself with soap (preferably liquid soap) and tepid water, or with water alone. Rinse skin with copious amounts of water for at least 20 minutes.
- Rinse eyes with water.
- Seek medical attention if needed, i.e., in case of large burns, poisoning symptoms (being sick, drowsiness, headaches, fever, seizures) or contact with an unknown chemical.
- In case of ingestion, do not induce vomiting. Call a poison centre and/or seek medical assistance.

If a chemical release is suspected, take the following steps:

- If inside a building or a closed space, find clean air quickly by exiting the building without passing through the contaminated area or by breaking a window.
- If outdoors, avoid any obvious plume or vapour cloud. Cover your mouth and nose and, if possible, any exposed skin, i.e., roll down sleeves, button up coat/jacket. Move away from the source the fastest way possible, preferably by moving crosswind or upwind. Contact the authorities and your team immediately to report the incident and receive additional instructions.

Nuclear and radiological emergencies range from power plant accidents to small incidents with

radiological materials. For these, the operators of these facilities, together with local and national authorities, have the primary responsibility for emergency response. Possible international assistance in the case of such incidents is coordinated through the International Atomic Energy Agency (IAEA).

Electrical burns

These usually stem from electrical shock. Before approaching the patient, be certain that no further risk of injury is present. If the patient is still in contact with the electrical source and you know it is low voltage, you may move the wire or the patient to a safe position with a dry pole or rope. If the wire is of unknown or high voltage, seek professional help to shut off the power or move the wire. Attempting to move wires yourself is dangerous and should not be done.

- As soon as it is safe to do so, check the patient's ABCs and continue to monitor them. Patients with electrical burns often suffer cardiac or respiratory arrest.
- If there are evident burns, cover them loosely with sterile dressings.
- Seek professional help in treating the burns. Do not apply burn creams or ointments.

Thermal burns

These range from mild sunburn to the severe burns associated with open flames, heated metal and scalding water. Thermal burns are categorised by degree: first, second and third-degree burn, and appropriate treatment is keyed to the severity of the burn.

Degree of burn	First degree burns (superficial burns)	Second degree burn (partial thickness burns)	Third degree burns
Symptoms	<ul style="list-style-type: none"> • Minor swelling • Redness of the affected area. 	<ul style="list-style-type: none"> • Definite redness of the affected area • Swelling • Blistering 	<ul style="list-style-type: none"> • Dense white, waxy or even charred appearance. • Areas of deeper burning, surrounded by areas that display first and second degree burn characteristics.
Treatment	<ul style="list-style-type: none"> • Apply cool running water or wet compresses as soon as possible, continuing until the pain subsides. • Leave the burned area exposed and do not apply ointments or salves. • If pain recurs, reapply cool water. 	<ul style="list-style-type: none"> • Apply sterile water for 15-30 minutes and cover with a dry, sterile bandage. • Treat the patient for traumatic shock. 	<ul style="list-style-type: none"> • Check the ABCs and continue to monitor them. • Treat for traumatic shock and cover the burned area with a sterile, non-adhesive dressing. • Elevate the burned area.
Professional help?	n/a	Seek professional help.	Seek professional help immediately.

Fractures (broken bones)

Usually, the patient will know if they have broken a bone. The symptoms are bruising around the fracture site, localised pain, deformity and swelling. In treating a fracture, the objective is immobilisation of the ends of the broken bone. Immobilise any fracture before moving the patient. This is especially important in the case of known or suspected spinal injury. When splinting a fracture, immobilise the adjacent joints as well as the fracture site. After splinting is completed and on a continuing basis until professionally treated, check circulation in the affected extremities. In the case of an open fracture (when the bone breaks the surface of the skin), the bleeding will most likely need to be controlled using pressure points instead of applying direct pressure. Treat for shock routinely in fractures of major bones and open fractures, while continuing to monitor for the onset of traumatic shock symptoms. Open (compound) fractures require immediate medical attention.

Frostbite

Frostbitten tissue will feel cold to the touch and be either numb or painful to the patient. An early sign will be whitening of the skin which may be treated by holding a warm part of the body on the cold part, e.g., cold cheekbones may be warmed up with the palm of the hand. In extreme cases, the tissue will turn white and harden. To treat, gently warm the affected areas in a heated space, using lukewarm water where it is possible to immerse the affected area. Give the patient warm fluids and be alert to signs of shock. Re-warming the tissue too rapidly will cause circulatory problems and possibly worsen the tissue damage. Prevent injured fingers, toes, etc., from rubbing against each other by placing gauze pads between them. Seek medical attention for all but mild cases, as there is risk of septicaemia and gangrene in more severe cases.

Hypothermia

The patient will shiver in the early stages of hypothermia, but once the body core temperature goes below about 32°C (90°F), shivering may stop. The patient will be uncoordinated and may demonstrate mental confusion, slurred speech and irrational behaviour. Merely bringing the patient into a warm

space will not reverse severe cases. Remove any wet or constricting clothing, place the patient in a pre-warmed bed or sleeping bag and add water bottles of warm (not hot) water around the torso. If warm water is not available, use one or more warm, dry people in the sleeping bag or bed together with the patient to provide heat. If the patient is sufficiently conscious to protect their airway, give them warm (38-45°C/100-115°F) fluids such as lemonade. This provides readily absorbed fuel (sugar) and a means to provide heat to the body core.

A phenomenon known as 'After Drop' can occur because of aggressive rewarming. Redistribution of blood to the whole body can lead to a further drop in core temperature, with a full range of medical complications arising as a consequence. This can be prevented by moderated warming techniques. If the casualty has vital signs, is insulated and immobile, there is no rush to actively warm them.

If a patient has contracted hypothermia in a horizontal position, e.g., having been immersed in water or being caught by an avalanche, be extremely careful with rising him/her to a vertical position. Standing up quickly can cause a sudden drop in blood pressure as the vascular system cannot constrict fast enough in the lower limbs and abdomen to squeeze oxygenated blood up to the brain. This drop in blood pressure can reduce blood supply to both the brain and heart to the point of unconsciousness or cardiac arrest.

Heat exhaustion

The patient usually sweats profusely, feels clammy to the touch, may complain of a headache or nausea and may be disoriented and feel weak. If you suspect heat exhaustion but the patient is not sweating, see heat stroke (below). Get the patient out of the direct sun and cool them down by applying cold compresses and fanning. If they are conscious, give oral rehydration solution and water, or plain water. If recovery is not fairly immediate upon treatment, seek medical attention.

Heat stroke

The patient will have hot, dry skin and a temperature well above normal. This situation is life-threatening

and must be treated immediately and aggressively. In more advanced cases, the patient will lose consciousness and may convulse. Get the patient out of the sun and into a cool space.

Remove their clothing and immerse them in cold (not icy) water until the onset of shivering. Seek medical attention. You must immediately lower the body temperature or the patient may die.

J.9 Protection mainstreaming activities by sector

The following list of actions provides guidance for putting protection principles into practice in the context of disaster preparedness and response. It is not strictly a checklist for UNDAC members, but provides some overall considerations at cluster/sector level with a view to ensuring people's access to impartial assistance, according to need and

without discrimination. The list could be useful if the Protection Cluster is not activated and no Focal Point is in-country. The non-exhaustive list of actions have been written (based on Protection Cluster guidance) to help national and international protection workers to:

- Improve their understanding of the rights and vulnerabilities of different groups affected by disasters.
- Identify and respond to common protection threats.
- Support protection-sensitive approaches to post-disaster recovery and rehabilitation.

Small changes in the management and delivery of humanitarian assistance can sharply reduce protection risks and violations; and enhance the rights of affected people. In addition, inclusiveness and mainstreaming protection improves the overall effectiveness and efficiency of all sectors, because it ensures that humanitarian assistance reaches every disaster-affected person in need.

AREA/SECTOR	ACTIVITIES
Evacuations	<ul style="list-style-type: none"> • Ensure that the means of transport used for evacuations are accessible to all persons in need (e.g., they should also allow for the onboarding of wheelchairs). Persons in need often have to be accompanied by caregivers, these people have to also be accounted for in the planning. • Ensure evacuation plans address the needs of people who are hard to reach (who are housebound, in hospitals, orphanages or prisons, older or with disabilities). Assist them to reach evacuation sites, pack their belongings, and board transport. Map their location for emergency response teams. Make sure the assistive devices of persons with disabilities or older people (hearing aids, crutches, glasses, wheelchairs, etc.) are not forgotten or damaged during the evacuation. • Establish protocols to prevent family separation during evacuations (register each family member, provide name tags for babies, ensure families travel together, etc.). • Enable people to make informed choices about their evacuation. Provide information on the services available at emergency shelter sites and measures in place to protect land and property left behind, etc. • Organise information campaigns. Target (1) groups that are difficult to reach, using (2) a variety of media, in (3) all relevant local languages. Make door-to-door calls, and employ media used by those with impaired hearing and sight. Target institutions or semi-autonomous living spaces. Involve organisations of persons with disabilities, associations of older persons, etc. for advice and support. • Make clear that forced evacuations must be justified, based on law, and implemented without discrimination.

AREA/SECTOR	ACTIVITIES
	<ul style="list-style-type: none"> • During evacuations, prioritise (1) sites where people face the greatest physical risk; and (2) inside those sites, people who require assistance (such as older and persons with disabilities, women, unaccompanied children, female or child-headed households, minorities, etc.). Do not forget that people living in institutions also require evacuations.
Evacuations	<ul style="list-style-type: none"> • Establish protocols to avoid and manage conflicts over property and theft. Encourage property owners to list their assets before evacuation or on arrival at an emergency shelter. • Discourage attempts to return to areas of high risk by establishing cordons, warning signs, patrols, etc. • Once it is safe to return to affected areas, support 'go and see' visits and disseminate regular information on safety, available options, livelihoods assistance programmes, etc.
Contingency planning and disaster preparedness	<ul style="list-style-type: none"> • Assess potential emergency shelter sites for accessibility, physical and social risk, employing multi-sectoral teams. Pick sites on grounds of accessibility, safety, proximity to the disaster site and access to livelihoods. • Ensure that legislation adequately covers all the issues that may arise after a natural-hazard related disaster. • Safeguard birth registration data and housing, land and property records (e.g., integrate local data in a central database, update and back up records).
CCCM	<ul style="list-style-type: none"> • Prioritise allocation of shelters to families with vulnerable members. • Make sure that older persons, persons with disabilities, single women, and unaccompanied children and youth: (1) are housed in appropriate shelter, close to toilets, bathing facilities and aid distribution points; (2) are placed with appropriate groups (relatives, other vulnerable persons, etc.) and, at the minimum, are accommodated separately from unrelated males; (3) receive priority access to food and NFIs, which have to be culturally appropriate. • Provide shelters that can accommodate families of different sizes. Allocate one family per shelter. Provide separate accommodation for pregnant women and breastfeeding mothers. • Adapt facilities to reflect the needs of older and disabled persons (handrails, wheelchair access). • Arrange, in cooperation with WHO and the Red Cross Red Crescent Movement, for the provision of mental health and psychosocial services for those who need it. • Prioritise older people, persons with disabilities or injured people for relocation to more suitable locations. • Make sanitary facilities safer, as well as food and water collection points and child-friendly spaces, by means of floodlighting and patrols. • Provide child-friendly spaces, youth clubs, and schools. • Preserve the humanitarian character of camps and evacuation sites. Camps and sites set up by military forces or armed groups must be transferred to civilian management as soon as possible; the role of police and security forces should be limited to provision of security. • Where required and appropriate, place national or international police in shelter sites. • Monitor security, and promote community arrangements for monitoring, prevention and responding to security risks. Make sure that plans for the closure of camps or evacuation sites include shelter and protection strategies that promote durable solutions.

AREA/SECTOR	ACTIVITIES
Early Recovery	<ul style="list-style-type: none"> • Develop vocational training and micro-credit programmes that target female-headed households and persons with disabilities; facilitate their self-sufficiency and employment. • Ensure that livelihood and support programmes (cash- and food-for-work, etc.) include youth, women, persons with disabilities and older persons and address their constraints (by providing part-time, flexible and home-based work, etc.). • Address the causes of child labour (such as poverty and unemployment), for example by offering return-to-school incentives, reducing family indebtedness, or promoting employment of adult family members, providing building skills, etc.
Education	<ul style="list-style-type: none"> • To avoid child labour and promote schooling, link education strategies to livelihood initiatives. • Ensure children can attend schools, at evacuation sites, at return, and if relocated.
Food Security and Nutrition	<ul style="list-style-type: none"> • Ensure that distribution mechanisms: (1) respect local customs; (2) provide food in quantities that can be carried easily; and (3) facilitate direct delivery to people with limited mobility (such as older persons and persons with disabilities). • Introduce strategies that facilitate food distribution to individuals who lack documents and to IDPs living in urban areas or with host families, etc. • Ensure that food meets the nutritional needs of children, pregnant and lactating women, older persons, and people with special nutritional needs. For example, food supplies should be easy to open, chew and digest.
Health and Psychosocial support	<ul style="list-style-type: none"> • Provide health services and medicines that address disaster-related injuries and rehabilitation; provide care in regard to obstetrics, chronic diseases, midwifery, and paediatrics. • Ensure that individuals who have limited mobility (older persons, persons with disabilities, women restricted for cultural reasons, etc.), as well as IDPs who lack documentation or who live in urban areas or with host families, have access to health services (home visits, mobile clinics, transport services etc.). • In cooperation with MHPSS providers, develop programmes that address the psychosocial needs of children, youth, widows, older persons, and persons with disabilities. (Consider counselling services and 'hotlines'; support and self-help groups; community-based networks: religious or customary events and rituals; community and sports activities.) • Ensure that relief workers and others involved in the provision of relief activities are allowed to take breaks, and are supported to take care of their own mental health.
Protection	<p data-bbox="427 1599 692 1637">Personal documentation</p> <ul style="list-style-type: none"> • Establish programmes to assist individuals to obtain, recover or replace personal documents at low or no cost. • Establish safeguards, and monitor, to ensure that individuals who have lost personal documents are not detained arbitrarily or prevented from accessing humanitarian aid or housing programmes. • Advocate for flexible evidence requirements on proof of identity when documents are lost, and interim solutions (for example, community-based approaches). • Ensure that women and unaccompanied or orphaned children are issued personal documents in their names.

AREA/SECTOR ACTIVITIES

Monitoring

- Establish an inter-agency mechanism to coordinate monitoring and analyse the full range of protection risks to vulnerable groups. Ensure the mechanism is safe, confidential and respects privacy, and it is shared (as appropriate) across sectors.
- Raise awareness in the community about protection risks and, where it can be done safely; establish community-based mechanisms to support monitoring, prevention and response.
- Develop referral mechanisms (support services and information management systems) to facilitate case management.

Family separation and reunification

- Establish protocols to prevent family separation during evacuation and secondary population movements. Tag babies; ensure that families travel together, do not separate persons with disabilities or older people from their caregivers, etc.
- Establish procedures for identifying and registering separated children; set up family-tracing and reunification programmes. Adopt a coordinated approach (use shared registration forms, house the identification database in one agency).
- Include older persons, persons with disabilities and unaccompanied minors in family tracing and reunification programmes.

Rule of Law

- Support local authorities to restore law and order swiftly and prevent criminality. For example, conduct patrols; facilitate the repair or relocation of courts, police stations and correctional facilities; replace justice sector staff. If necessary, temporarily assign staff from unaffected locations.
- Train newly appointed judicial staff in disaster-related issues (guardianship appointments, housing, land and property issues, etc.).
- Decentralise legal services (via mobile legal aid clinics, or informal and customary leaders) in order to provide legal information and assist people to access humanitarian aid or compensation programmes.
- Provide technical assistance to develop and monitor specifically established legal or administrative fora.
- Disseminate information on legal issues (replacement of personal documents, land law policy, inheritance and guardianship laws, etc.).
- Provide technical assistance to guide the drafting of emergency laws and decrees that may be required.
- Disseminate widely emergency laws and decrees that regulate freedom of movement (no-go zones, curfews, etc.), in formats and languages that make them accessible and understandable to all, particularly those in emergency shelters.
- Advocate for minimum standards in detention facilities, particularly timely case processing and the separation of children from adult male detainees. Persons with disabilities should also be separated from other detainees. Monitor their situation frequently.

AREA/SECTOR	ACTIVITIES
Shelter/NFI	<ul style="list-style-type: none"> • Ensure vulnerable groups: (1) receive separate and appropriate shelter; (2) are helped with shelter construction; (3) receive shelter that is lockable and opaque. • Include sanitary supplies for women and portable light sources in NFI packages. • Ensure that distribution mechanisms: (1) respect local customs; (2) supply materials in easily carried packages; (3) facilitate access by people with limited mobility (by direct delivery, separate distribution points, mobile services); and (4) promote dignity (for example, prevent excessive queuing and overcrowding). • Ensure that shelter programmes are accessible to and include individuals who lack documents and IDPs living in urban areas or with host families, etc. • When distributing humanitarian aid, include mental health institutions, hospitals, orphanages, etc. • Make sure information strategies on the relief process target: (1) groups that are difficult to reach, using (2) a variety of media, in (3) all relevant local languages. Make door-to-door calls and employ media used by those with impaired hearing and sight.
WASH	<ul style="list-style-type: none"> • Bathing, toilet and water collection facilities should be: (1) separated by gender; (2) lockable; (3) well-lit; (4) close to vulnerable groups' shelters; and (5) include handrails or other measures to facilitate access by older and persons with disabilities.

J.10 Respiratory infections and other airborne transmitted pathogens

This chapter provides UNDAC members knowledge and references on various infectious biological hazards and how they may impact the UNDAC missions. To cite only some examples: Influenza, Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), Middle East Respiratory Syndrome Coronavirus (MERS)-CoV, SARS-CoV-2 (COVID-19), Respiratory Syncytial Virus (RSV), Avian Influenza Virus, other respiratory viruses with epidemic or pandemic potential¹.

The insights provided here add to **Chapter I.2.2** Epidemics and Pandemics and guidance and contingency plans found in the UNDAC Toolbox.

J.10.1 Definition & metrics²

“Airborne transmission of infectious agents refers to the transmission of disease caused by dissemination of very small droplets that remain infectious when suspended in air over long distance and time” ([WHO, 2020a](#)). “Viruses, bacteria and fungi can be disease-causing pathogens and spread from one infected person to another through activities such as coughing, talking, and sneezing” ([WHO, 2014a](#)).

¹ This list is non exhaustive

² .We recognize differences between pathogens transmitted through close contact (<1 m) and those that can travel longer distances. In our current analysis, we are also considering the potential spread of an unknown pathogen (referred to as Disease X) over longer distances, and we are preparing for the worst-case scenario by examining possible measures for prevention and control.

We understand that the actions needed will have a significant impact on the overall organization, but we believe a proactive and thorough approach is necessary to minimize potential hazard. Our primary concern is the risk of a potential health emergency due to widespread transmission, and the measures we are proposing are provisional, lasting 2-3 weeks, until more information is collected.

Therefore, we strongly recommend taking precautions and implementing all measures as if the pathogen could spread at distances >1 m. This includes considering fomite transmission (involving contact with a contaminated object or surface) and recognizing that animals can transmit some pathogens (for example, birds in the case of Avian Influenza, dromedary for MERS). Being cautious and prepared for the worst-case scenario is crucial in minimizing the impact of a potential health emergency.

Transmission can occur through direct contact with an infected person (through particles released into the air both in close physical proximity and over longer distances), indirect contact with contaminated objects, direct or indirect contact with infected animals ([Leung, N. H. L., 2021](#)).

Primary hazard:

Infectious disease linked to the pathogen that is causing the outbreak ([Rogers, D. P. et al., 2020](#)).

Metrics³:

- **Infection-specific indicators:**
 - » **Incubation period:** time between infection and the symptoms onset ([Yan, P., 2008](#)). Indications on this time frame to determine the time monitoring window of healthy individuals movements, for public health intervention plans (e.g., social distancing, quarantine period) ([Lessler, J. et al., 2009](#); [Nishiura, H., 2009](#)), and for treatments ([Zhao, S. et al., 2021](#)).
 - » **Latent period:** or pre-infectious period, time window between infection and infectiousness when infected individuals cannot transmit the disease ([Milwid, R. et al., 2016](#)). Latent period is usually equal or less than incubation period, and informs on disease transmission ([Zhao, S. et al., 2021](#)).
 - » **Infectious period:** time interval in which the transmission between infected and susceptible individuals can occur; it is challenging to be estimated correctly since this period could overlap with the incubation period ([Milwid, R. et al., 2016](#)). During overlapping, infected people, still in the asymptomatic phase, could infect other individuals ([Milwid, R. et al., 2016](#)).
 - » **Asymptomatic infection ratio:** number of asymptomatic infections of a determined disease among all the infections ([Xiang, Y. et al., 2021](#)). Asymptomatic individuals show no or mild symptoms and the ratio allows to assess transmission potential ([Xiang, Y. et al., 2021](#)).
- » **Infection fatality ratio (IFR):** number of deaths among all identified cases of a particular disease. It describes the risk of death per infection and offers an understanding of the lethality of the disease among infected population ([Luo, G. et al., 2021](#)).
- » **Basic reproduction number (R0):** number of new infections, in a susceptible population, generated by a single infected individual, during the entire infectious period ([Heffernan, J. M. et al., 2005](#)). It informs on the infection contagiousness and transmission. A R0 lower than 1 indicates that each infected individual produces less than one secondary infection, whereas a R0 higher than 1 means that the pathogen is able to invade the susceptible population, and is likely to continue spreading ([Heffernan, J. M. et al., 2005](#)).
- » **Effective reproduction number (Rt):** it is similar to R0, but includes the changes in population's susceptibility - vaccinations, previous infections, public health interventions (e.g. social distancing, quarantine) - ([Gostic, K. M. et al., 2020](#)). While R0 represents the basal transmission, Rt indicates the actual transmission rate at a specific time ([Lim, J. S. et al., 2020](#); [CDC, 2023a](#)).
- **General disease impact indicators:**
 - » **Morbidity:** state of being symptomatic or unhealthy; morbidity indicators are designed to measure the occurrence of diseases, injuries, and disabilities in populations ([PAHO/WHO, 2018](#)). Morbidity is usually represented using incidence or prevalence rates ([Hernandez, J. B. R. and Kim, P. Y., 2023](#)). Incidence analyses the occurrence of new events, while prevalence helps in planning and organizing existing resources as well as asking for additional support ([PAHO/WHO, 2018](#)):
 - **Incidence rate:** number of new cases of a disease divided by the population at risk for the disease during a specific period ([PAHO/WHO, 2018](#)). This helps in understanding how quickly a disease is spreading ([van Severenter, J. M. and Hochberg, N. S., 2017](#)).

³ These metrics are important for public health officials to track diseases spreading and to assess their impact to select the correct strategies for infection control and prevention. Differences in terms of morbidity and mortality rates call for actions and strategies depending on infection with high spreading but low mortality or low spreading and high mortality.

- **Prevalence rate:** number of existing cases of a disease divided by the total population at a specific time. A single observation of each individual is performed and the information regarding individual status is obtained ([PAHO/WHO, 2018](#)). It represents the current overall population outcome ([Tenny, S. and Hoffman, M. R., 2023](#)).
- » **Mortality:** the oldest and most common source of data regarding the population health status ([PAHO/WHO, 2018](#)). Mortality rate measures deaths frequency in a defined-population and -period of time ([Choi, J. et al., 2019](#)). WHO defines the estimated general mortality rate as the “estimated total number of deaths in a population of a given sex and/or age, divided by the total number of this population, expressed per 100,000 population, for a given year, in a given country, territory, or geographic area” ([WHO a](#)). Mortality data are a fundamental source of demographic, geographic, and cause-of-death information, and used to quantify and monitor health problems ([PAHO/WHO, 2018](#)). Due to differences in life expectancies worldwide, a standardisation of mortality rate according to the age is required for a better comparison ([PAHO/WHO, 2018](#)).
- » **Hospitalization rate:** number of people requiring hospitalization due to a specific disease, it informs on healthcare burden ([Hamid, H. et al., 2020](#)).
- » **Attack rate:** in a specific time, portion of at risk population who becomes. Similarly, the secondary attack rate is the proportion of a susceptible population that contract the infection in a defined group (e.g., close contacts). It indicates how social interactions relate to transmission risk ([Wu, J.T. et al., 2011](#); [Liu, Y. et al., 2020](#)).
- » Short- or long-term respiratory conditions and/or other health implications ([CDC, 2022](#)).
- » Mental health conditions (distress, anxiety, and depression) due to the fear of infection, uncertainty, isolation, and social-related implications (stigmatization and discrimination) ([WHO b](#); [UNSDG, 2020](#)).
- » Exposure to infectious disease outbreaks can lead to the development of post-traumatic stress symptoms (PTSS) ([Qiu, D. et al., 2021](#)).
- Healthcare and frontline workers might experience stress and burnout ([Luo, Y. et al., 2020](#); [Babamiri, M. et al., 2022](#); [Qiu, D. et al., 2021](#)), together with being highly exposed to the infection source ([Madhav, N. et al., 2017](#)).
- Excess of mortality linked to the pathogen or to the community crisis ([Rogers, D. P. et al., 2020](#); [Eurostat, 2020](#)).
- **Services disruption impact:**
 - » Services overwhelming can cause a shortage of medical resources, hospital beds, medical supplies, and healthcare staff ([Rogers, D. P. et al., 2020](#)).
 - » Food and service insecurity, challenges in the import/export of materials, food, and goods ([UNDRR/ECLAC, 2021](#)).
 - » Restructuring of social priorities ([UNDRR/ECLAC, 2021](#)).
 - » Increased number of poverty and malnutrition ([UNDRR/ECLAC, 2021](#)).
 - » Productivity losses ([Rogers, D. P. et al., 2020](#)).
 - » Unemployment of “day labourers” and people with short contracts ([Lee, A. and Cho, J., 2016](#)).
 - » Tourism sector income decrease with possible significant economic loss and negative impacts ([UNDRR/ECLAC, 2021](#)).
 - » Lack of education opportunities ([Rogers, D. P. et al., 2020](#)).
 - » Political and financial instability and international tensions ([UNDRR/ECLAC, 2021](#)).

J.10.2 Impact on population⁴

- **People infected might develop:**

4 The complex connections between environmental, human, political, and economic systems lead to systemic risk and cascade impacts. Supply networks and systems for information, finances, food, health, energy, and the environment are generally intricate, interconnected, and prone to vulnerability. The socio-economic impact can be worst in countries with underlying factors such as poverty, inequality (gender, ethnicity, and social status) and informality ([UNDRR/ECLAC, 2021](#)).

- » Increase in crime, social chaos, civil disobedience and linked infection transmission rise ([Rogers, D. P. et al., 2020](#)).

J.10.3 Potential aggravating factors⁵

- **Host-related factors (i.e., characteristics of the population affected by the pathogen):**

- » Vulnerable population:
 - Infants, children, and elderly people are generally at higher risk for severe respiratory illness and complications ([WHO, 2014a](#)).
 - Chronic conditions such as lung and heart disease, diabetes, cancer, weakened immune systems, concurrent infections, malnutrition and pregnancy can play a role in the illness outcome ([WHO, 2014a](#); [UNDRR, 2021](#); [CDC, 2023b](#)).
- » Smoking and vaping can weaken the lungs and the immune system, making individuals more vulnerable to respiratory infections ([WHO, 2014a](#); [Stanford Medicine, 2024](#)).
- » Host ability to transmit the disease ([WHO, 2014a](#)): it depends on biological (e.g. whether the host can transmit the pathogen while being asymptomatic) and behavioural (e.g. personal hygiene practices) ([Aiello, A. E. and Larson, E. L., 2002](#)).

- **Pathogen related factors:**

- » Pathogen characteristics, like transmission mode and virulence factors (e.g. presence of toxin genes) ([WHO, 2014a](#)).
- » Inoculum size; number of infectious agents present at the start of an infection ([WHO, 2014a](#)).
- » Ability to infect animals and other species that can act as vectors ([Short, K. R. et al., 2015](#)).

- **Environmental factors:**

- » Exposure to air pollution, temperature, and humidity ([WHO, 2014a](#)).

- » Poor room ventilation and indoor air quality ([WHO, 2014a](#)).

- **Factors related to healthcare readiness and resources:**

- » Lack of hospital capacity, diagnostics, treatment, personal protective equipment (PPE) availability, stocks - masks, gloves, disinfectants - and appropriate laboratory facilities ([ECDC, 2023](#); [Mohammadpour, M. et al., 2021](#)). Ability to implement community-related interventions, management, and socio-economic factors play a role in readiness and responsiveness ([Mohammadpour, M. et al., 2021](#)).
- » Availability of medical care, infection prevention and control (IPC), healthcare, and isolation facilities ([WHO, 2014a](#)).
- » Absence of vaccines or low vaccination rates ([WHO, 2014a](#)).
- » Low level of insurance or government health expenditure ([UNDRR/ECLAC, 2021](#)).
- » Lack of health workers or trained personal (doctors, nurses). Their infection can exacerbate the issue of availability of human resources ([UNDRR/ECLAC, 2021](#)).
- » Lack of essential goods - drinking water food, shelters, clothes -, medications, and detergents ([UNDRR/ECLAC, 2021](#)).

- **Presence of socio-political vulnerabilities:**

- » Population characterised by poverty, inequality (disability, gender, ethnicity, race, religion, and social status), informality, and lack of political representation ([UNDRR/ECLAC, 2021](#)).
- » High mental stress level ([UNDRR/ECLAC, 2021](#)).
- » Political and financial instability and disorders ([UNDRR/ECLAC, 2021](#)).

J.10.4 Typical assistance needs⁶

When a community faces a respiratory infection outbreak, a rapid, coordinated, and adaptable

⁵ The list of potential aggravating factors and their description is not exhaustive.

⁶ We recommend referring to [the International Health Regulations \(IHR – WHO, 2005\)](#), which provides a legal framework for countries' rights and obligations in handling public health events and emergencies with cross-border potential.

response is crucial for an effective management. Consultants should maintain a strong relationship with counterparts involved and be sensitive to the norms of the community (CDC, 2018a). All countries must strike a fine balance between protecting health, minimizing economic and social disruption, and respecting human rights (WHO c).

Cost-effective strategies to increase pandemic preparedness, especially in resource-constrained settings, aim to strengthen core public health infrastructures. This includes water and sanitation systems and increase situational awareness, rapidly extinguishing sparks that could lead to pandemics (Madhav, N. et al., 2017).

- **Public Health interventions:**

- » Masks, hygiene items, and concise information sheets distribution understanding (UNICEF, 2020).
- » Diagnostic test to identify and isolate cases promptly (ECDC, 2020).
- » Systems to trace and quarantine contacts of infected individuals in appropriate facilities and protocols editing and update (ECDC, 2020).
- » Surveillance and monitoring to track infection spread and severity (ECDC, 2022).
- » Syndromic surveillance on health-related data based on clinical observations (WHO, 2014b).
- » Risk Communication and Community Engagement (RCCE): clear, informative, and on time communication transmission to the community about the outbreak (WHO d).
- » Share information with key stakeholders (Kamalathne, T. et al., 2023) with misinformation, disinformation, and malinformation management (OECD, 2020a).
- » Proper communication during the outbreak (CDC, 2018b). Clear and concise information advertisement in multiple languages for an effective communication. Include emergency

contact numbers and official channels, and consider incorporating infographics for prompt understanding (UNICEF, 2020).

- » Provide housing or shelters, financial support for the affected population, like temporary rent assistance, defer and/or reduce utility bills (UNDRR/ECLAC, 2021).
 - » Furnish continuity of essential services - food (emergency feeding programmes if needed) and water supply - utilities, vector control (if in place), and emergency services (UNDRR/ECLAC, 2021).
 - » Ensure continuity of sectors such as fuel, energy, telecommunications, banking and finance, law and order, post, and manufacture services (UNDRR/ECLAC, 2021).
 - » Mitigate animal and public health risks: farm, market, food chain biosecurity, surveillance, movement control, depopulation, tracking, vaccination (if allowed), and food hygiene (UNDRR, 2021). For a more in-depth analysis, refer to the World Organisation for Animal Health (WOAH, founded as OIE) Codes and Manuals (WOAH, 2023).⁷
- **Medical assistance and administrative control needs⁸:**
 - » Healthcare facilities to handle the increased number of patients (WHO, 2020b).
 - » Adequate PPE, other supplies, and medications (CDC, 2016).
 - » Vaccination and antiviral prophylaxis for health-care workers, if applicable (WHO, 2014a).
 - » Ensure healthcare professionals, possibly including support of temporary staff or volunteers, and ensuring their well-being (WHO, 2014a).
 - » Create a health-care worker surveillance system for influenza-like illness (ILI) (WHO, 2014a).
 - » Limit patient movement and ensure appropriate room settings (ECDC, 2022).

⁷ WOAH is the reference organization by the World Trade Organization (WTO) for international standards relating to animal health and zoonosis (EC, food safety).

⁸ Please refer to the document: Infection Prevention and Control of epidemic- and pandemic-prone acute respiratory infections in healthcare (WHO guidelines) 2014, for more recommendations, best practices and guidance (WHO, 2014a).

- » Use disposable or dedicated patient-care equipment ([CDC, 2016](#)).
 - » Establish treatment guidelines based on the available treatments and evidence of the situation ([WHO, 2023](#)).
 - » Appropriate waste management ([UNEP, 2020](#)).
 - » Appropriate management of dead bodies ([WHO, 2014a](#)), ensuring dignity and respect of the religions and cultural practices in line with public health and safety considerations ([IFRC/ICRC/WHO, 2020](#)).
 - » Psychological support to the population ([WHO, 2022](#)).
 - » Ensure maternal, new-born, children and adolescents health services and rights ([UNFPA, 2020](#)).
 - » Organize medication, care - including home-based - and community visits for elderly people, as the restrictions may disproportionately affect them ([WHO, 2020b](#)).
 - » Guarantee medications for communicable diseases, such as HIV (including pre-exposure prophylaxis), hepatitis, sexually transmitted infections, tuberculosis ([WHO, 2020b](#)).
 - » Organize medical attention for non-communicable diseases; guarantee the required drugs for cardiovascular diseases, cancer, diabetes, chronic respiratory diseases, chronic kidney disease, oral health conditions, and palliative care ([WHO, 2020](#))⁹.
 - » Maintain sexual and reproductive health services (e.g. contraception, abortion, fertility care, disease treatments) ([UNFPA, 2020](#)).
 - » Ensure support and access to vital services for those struggling with addiction (e.g. illegal drugs, gaming), acknowledging the added difficulties posed by the crisis ([EMCDDA, 2020](#); [Levander, X. A. et al., 2022](#); [WHO, 2020b](#)).
- **Preventive Measures:**
 - » Organize vaccination campaigns, if available ([WHO, 2020b](#)).
 - » Promote hand and respiratory hygiene, cough etiquette, and disinfection practices ([CDC, 2016](#)).
 - **Research and Collaboration:**
 - » Lockdown, promote social distancing, schools closure, teleworking, cancel mass gatherings and implement containment and mitigation policies - limit people movement within and between communities to slow down disease spread and/or implement tests to facilitate it - ([OECD, 2020b](#)).
 - » Share data, material, and resources with local public bodies and international bodies, and other countries to coordinate a local and global response ([WHO e](#)). Promote open communication among different stakeholders to achieve a coordinated, prompt, and effective action, eventually reducing the impact on population ([WHO, 2023](#)). International data sharing and cooperation allow researchers to study the virus directly ([Jit, M. et al., 2021](#)). This leads to the quick development of diagnostic tools, vaccines, treatments, and effective containment strategies vital in combating viral epidemics and preparing for future health emergencies ([Pratt, B. and Bull, S., 2021](#)):
 - Rapid and transparent sharing of biological material and pathogen-related information, including genetic material ([WHO f](#)).
 - Epidemiological data collection and sharing, like transmission mode, number of confirmed cases, hospitalizations, and deaths ([WHO, 2005](#)).
 - Epidemiological data on animals, if needed ([WOAH, 2023](#)).

J.10.5 Rapid risk assessment, impact analysis and forecast

During a viral outbreak with the potential to become an epidemic, it is mandatory to consider various factors in order to limit the spread and impact of the infection. A combination of environmental data, modelling, and surveillance is essential for epidemic prediction and a better response ([Myers, M. F. et al., 2000](#)). The forecast for an infection outbreak should include ([Myers, M. F. et al., 2000](#); [Desai, A. N.](#)

⁹ This list is non exhaustive.

[et al., 2019](#); [Lutz, C. S. et al., 2019](#); [Pollett, S. et al., 2020](#); [Pollett, S. et al., 2021](#); [Luan, J. et al., 2022](#)):

- **Data analysis:** Collect and analyse data on the infection based on the metrics previously described (e.g. morbidity, mortality, incubation period, R_t), together with demographical information (sex, age, characteristics of affected individuals, risk factors, aggravating factors) ([Anastassopoulou, C. et al., 2020](#)).
- **Review historical data:** review previous infection outbreaks in a systematic way, to understand past epidemic patterns to forecast the correct measures for new outbreaks ([Pollett, S. et al., 2021](#)). Characteristics of the main epidemics and pandemics of the last millennia, together with the different interventions implemented, and the lessons learned to improve pandemic preparedness, could be found in [Williams, B. A. et al. \(2023\)](#).
- **Epidemiological modelling:** apply modelling strategies to predict spread of infections and to possibly identify infection peaks. Different computational models are available for various outbreaks forecast ([Nsoesie, E. O. et al., 2014](#); [Dembek, Z. F. et al., 2018](#); [Kalantari, M., 2021](#); [Anastassopoulou, C. et al., 2020](#); [Pollett, S. et al., 2021](#); [Xiang, Y. et al., 2021](#)). For influenza outbreaks, for example, the autoregressive integrated moving average (ARIMA) model is typically used ([Nsoesie, E. O. et al., 2014](#); [Soebiyanto, R. P. et al., 2010](#)). For COVID-19 outbreak, susceptible-infectious-recovered-dead (SIDR) model has been applied, among others, although it does not take into account several parameters (e.g. incubation period, transmission modalities, and the effect of public health interventions) ([Anastassopoulou, C. et al., 2020](#)).
- **Healthcare system assessment:** evaluate the capacity of healthcare facilities, together with stocks availability of medical supplies (not only specifically involved in the infection, but also for general purposes) and of PPE ([Desai, A. N. et al., 2019](#); [Williams, B. A. et al., 2023](#)).
- **Public health intervention assessment:** plan and evaluate the impact of interventions (quarantine, social distancing, travel restrictions, contact tracing, medicinal treatments, vaccination, PPE use, infection screening) ([Xiang, Y. et al., 2021](#); [Ge, Y. et al., 2023](#)). Public health interventions should take into account economic and social impacts ([Xiang, Y. et al., 2021](#)).
- **Social behaviour evaluation:** assess current population social interactions and movements and predict changes in response to infection outbreak and related intervention (public health – e.g. social distancing effects) ([Eksin, C. et al., 2019](#); [Managi, S., and Chen, Z., 2022](#)).
- **Economic impact assessment:** evaluate the infection-related impact on economy and forecast possible related effects. Consider also general stocks (e.g. food, medicines, everyday use items), if issues to supply chain and/or work availability are foreseen ([EPRS, 2020](#); [Xiang, Y. et al., 2021](#); [Managi, S., and Chen, Z., 2022](#)).
- **Case scenario planning:** plan best-case, most likely-case, and worst-case scenarios, and plan for contingencies accordingly ([Kumar, G. et al., 2021](#); [Rakhshan, S. A. et al., 2023](#)). A worst-case scenario forecasting is suggested, being more conservative. Integrate a global perspective to achieve international strategies and cooperation. Consider also virus spread across borders ([Desai, A. N. et al., 2019](#); [Luan, J. et al., 2022](#)).
- **Plan research and development:** monitor ongoing research (promoting cooperation) for virus characterization, treatments, and vaccines development ([Williams, B. A. et al., 2023](#)).
- **Risk assessment:** perform risk versus benefit assessment when evaluating possible interventions (public health, social, medical, and economical) and communication strategies. Always perform ethical considerations, taking into account all populations, including more susceptible individuals. Several risk assessments of infectious disease threats are available on ECDC [website](#). After having assessed the risk, it is important to communicate it efficiently ([Recchia, V. et al., 2022](#)). Risk communication recommendations to guide institutions in proper communication are available ([Abraham, T., 2009](#)).
- **Plan proper communication:** ensure a clear and consistent communication with the public, to avoid misunderstanding. Communication via mass media and social media is essential to provide clarity underneath events, maintain trust in the organizations, and transmit useful messages ([Recchia, V. et al., 2022](#)). Best practices for communicating with the public during an outbreak,

epidemics, and pandemics are made available by WHO (2004; 2014a).

A continuous review and update of the forecast is suggested and forecast should be done in a long-term perspective, evaluating long-lasting changes and impacts. For a correct prevention and preparation of a future infection outbreak, an effective detection together with an early dissemination process could be significant (Kamalrathne, T. et al., 2023). Therefore, epidemiological surveillance, data analysis, and early warnings identification are essential in a context of early risk assessment of epidemics/pandemics (Kamalrathne, T. et al., 2023).

J.10.6 Early/rapid impact estimations

Early or rapid impact estimation is critical to evaluate disease's potential severity and spread to guide immediate public health responses.

The initial detection of an unusual increase in disease cases (see below for unusual explanation) or the identification of a new pathogen from surveillance systems or healthcare services, it follows a verification step and a confirmation of the outbreak (WHO, 2023). Data collection and analysis allow to evaluate the potential impact of the outbreak on public health and to determine the level of risk to human health, spread, and control capacity. The risk assessment will then be reported and disseminated (WHO, 2023). The situation analysis should examine the current state of the country's health system, including its strengths and weaknesses, as well as any specific challenges or vulnerabilities (WHO, 2023).

For better hazard surveillance, it is necessary to define indicators and set abnormal or unusual thresholds, which require public health interventions (WHO, 2014b). The first step is to understand if an event could be considered unusual, some examples:

- Being out of the regular season.
- Affecting a significant number of health workers.
- Appearance of new features (resistance, change in symptoms, affected groups, etc.)

- Presence in a limited period and geographic location.
- Characterised by an expected number of cases but with a higher case fatality ratio (CFR). (WHO, 2014b, WHO, 2023).

On the contrary, it is considered usual an elevated/slightly above the number of cases is in conformity with what is expected. In addition, risk on health systems, facilities and other countries should be considered (WHO, 2014b).

To monitor the process, several indicators (thresholds) should be defined¹⁰. These indicators should include time and place of occurrence, indicated as number of events/time/place (WHO, 2014b). The threshold could be set to one or more cases. For less common diseases, a more conservative approach (threshold set at one event) is preferable; cases include haemorrhagic fever, smallpox, poliovirus, new subtype of human influenza and SARS (WHO, 2014b; WHO, 2023). Instead, for more common diseases, like meningitis in Africa, the threshold is set on an increase compared to baseline values or over a period of time (WHO, 2014b). Data from either single or multiple/aggregated notifications should be analysed and interpreted at local and national level (WHO, 2014b).

As a complement to Indicator-Based Surveillance (IBS), Event-Based Surveillance (EBS) is used to gather intelligence from a wider range of sources, including non-official and non-conventional sources such as media reports or social media (WHO, 2012; WHO, 2014b; WHO, 2023). EBS allows for early detection and improved monitoring of public health threats, especially when official reports from local public health authorities are missing or delayed. Information emerging from EBS is however unstructured and subject to more uncertainty, therefore needing verification (WHO, 2012; WHO, 2023).

As soon as single or aggregated cases are notified or emerge as signals from EBS, their authenticity needs to be verified. A cross-checking of the data is performed, aiming to additionally collect

10 For more surveillance information refer to: WHO, 2010. Technical Guidelines for Integrated Disease Surveillance and Response in the African Region, 3rd ed. (<https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region-third>).

information for risk assessment ([WHO, 2014b](#)). The verification procedure is based on:

- “Contacting local health authorities;
- Contacting the original source;
- Cross-checking with other sources;
- Collecting additional information; and
- Checking for official information available on the internet” ([WHO, 2014b](#)).

Different systems and networks are designed to provide near real-time information about infectious disease outbreaks to provide early warning, risk assessment, and rapid impact estimation for infectious diseases. Some of the key electronic global bio-surveillance systems include¹¹:

- **The Epidemic Intelligence from Open Source (EIOS) initiative**, led by the WHO Hub for Pandemics and Epidemic Intelligence, brings together a number of public health authorities, partnerships and other relevant stakeholders worldwide (including UN agencies, ECDC, Africa CDC, national authorities and ONGs) to build a unified all-hazards One Health approach to early detection, verification, assessment, and communication of public health threats using publicly available information. Based on technology developed by the JRC, the EIOS system aggregates a large amount of information from selected sources (including media, official bulletins, and the other systems described below: GPHIN, ProMed, HealthMap, DONs) in various languages. It also allows for earlier collaboration

and exchange of signals at global level, across the aforementioned network of public health stakeholders ([WHO g](#); [WHO h](#); [WHO i](#); [GPHIN](#); [ProMED](#); [HealthMap](#)).

- **Global Public Health Intelligence Network (GPHIN)** is an internet-based early warning tool that gathers preliminary reports of health threats by monitoring global media sources ([GPHIN](#)).
- **Program for Monitoring Emerging Diseases (ProMED)** is an online service that identifies unusual health events related to emerging and re-emerging infectious diseases and toxins ([ProMED](#)). Information is curated by a multidisciplinary global team of subject matter experts in a variety of fields including virology, parasitology, epidemiology, entomology, veterinary and plant diseases ([ProMED](#)).
- **HealthMap** is another tool that performs automatic classification and monitoring of online information to detect signals of emerging infectious diseases ([HealthMap](#)).
- **WHO Disease Outbreak News (DONs)** reports online information on confirmed acute public health events or potential events of concern around the world ([WHO h](#)).
- **WHO’s Early Warning, Alert and Response System (EWARS)** in emergencies is an electronic simple and cost-effective disease surveillance system that detects disease outbreaks quickly before they spread ([WHO i](#)).

A full bibliography with further reading can be found in the UNDAC Toolbox.

11 The list is not to be considered exhaustive; it is essential to underline that the European Centre for Disease Prevention and Control (ECDC) and the Centers for Disease Control and Prevention (CDC) have surveillance and early warning systems for infectious diseases. Many other national and international agencies, research institutions, and collaborative networks work to monitor and respond to infectious diseases, contributing data and insights to the global effort (WHO, 2014b).