

Biological Warfare Agents: The "Dirty Dozen"								
	Pathogen	Incubation Period	Mode of transmission	Human/Human communicability	Infection Dose (Aerosol)	Symptoms	Duration of Illness	Lethality
Bacteria	Inhalational Anthrax <i>Bacillus anthracis</i>	2-7 days as a rule 48 hrs.	inhalation	no	8,000-50,000	Nonspecific symptoms of fatigue, myalgia, fever, nonproductive cough, followed by chest pain, respiratory distress, high fever, pneumonia. Other forms: Intest./Cutan. Anthrax (not as BW-Agents)	3-5 days (usually fatal if untreated)	untreated 80-90% treated <60%
	Pneumonic Plague <i>Yersinia pestis</i>	in a few hours	rats/ human flea inhalation	high	100-500	Acute: high fever, headache, productive cough blood-tinged sputum, vomiting. Haematogenous dissemination: sepsis, shock, meningitis	1-6 days (usually fatal if untreated)	untreated >95%
	Tularemia <i>Francisella tularensis</i> (Rabbit Fever)	1-14 days	inhalation ingestion percutaneous	no	10-50	Fever, chills, headache, myalgias, abdominal pain vomiting, diarrhea. Chest pain, pneumonia, cutaneous ulcer. Enlarged lymph nodes.	> 2 weeks	untreated >30%, treated 5%
	Brucellosis <i>Brucella suis</i>	3-60 days	inhalation ingestion	rare	10-100	Nonspecific: Fever, malaise, body aches, sweats, muscle and joint aches. Hepato-/splenomegaly	2-4 weeks	low
	Q-Fever <i>Coxiella burnetii</i>	3-40 days	inhalation ingestion	rare	1-10	Extremely infectious, no characteristic illness: severe headache, back pain, fatigue, weight loss	2-14 days	low
	Glanders: <i>Burkholderia mallei</i> <i>Burkholderia pseudomallei</i>	2 days to years	inhal./ingest. percutaneous	rare	low	Severe sickness, fever, rigors, pulmonary distress abscesses of internal organs (e.g. liver and spleen)	Death in 7-10 days (septicemic form)	untreated high
Viruses	Smallpox <i>Variolavirus</i>	8-18 days	inhalation	high	10-100	Acute: malaise, fever, headache, vomiting. Erythematous rash spread centrally to the trunk, quickly progresses to papules/pustular vesicles (centrifugal distribution). Pustules -> scabs after 8-14 days	4 weeks	not vaccinated 25-50% vaccinated 3%
	Venez. Equine Enzephalitis <i>VEE-Virus</i>	5-15 days	inhalation mosquitoes	rare	1-10	Acute febrile illness with severe headache, fatigue, photophobia, nausea, vomiting, rigors, myalgias (e.g. legs and lumbosacral area)	Days to weeks	low
	Marburg-Fever (Viral Hemorrh. Fever) <i>Marburg-Virus</i>	5-7 days	inhalation ingestion mosquitoes	medium	1-10	Myalgia, fever, headache, flushing of the face and chest, conjunctival/cutaneous bleedings, dizziness, hypotension, renal insufficiency, shock, death	Death between 7-16 days	high
Toxins	Botulism <i>Clostridium botulinum</i>	latent period hrs.-days	inhalation ingestion	no	LD50: 0.001µg/kg	Blurred vision, dilated pupils, photophobia, difficulty with speaking/swallowing, (severe) muscle paralysis	Death in 24-72 hrs; months if not lethal	high (>60%)
	Ricin-Intoxication <i>Ricin</i>	3 hrs-days	inhal./ingest. percutaneous	no	LD50:30- 50µg/kg	Fever, chest tightness, nausea, gastrointestinal ailment, resp. failure, pulmonary edema	Days (death within 10-12 days)	high
	SEB-Intoxication <i>Staphylococcal-Toxin</i>	latent period 1-6 hrs.	inhalation ingestion	no	ID50/pers. 0,03 µg/kg	Sudden onset of fever, chills, cough, vomiting, diarrhea. Higher exposure: septic shock	Hours to days	rare

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Definitions:

- a. Dose. The dose is the quantity of the compound received by the subject.
- b. LD50. The LD (lethal dose)50 is the dose which kills 50% of the exposed population.
- c. ID50. The ID (incapacitating dose)50 is the dose which incapacitates 50% of the exposed population.
- d. Ct (Concentration time). The Ct is a measure of exposure to a vapour or aerosol. The concentration in the air and the time of exposure govern the dose received, as does rate of respiration. It is assumed that, when the product of concentration and time is constant, so is the biological effect over a limited range of concentration and time. For very short or long exposures the biological effect may vary. Concentration is expressed as mg.m⁻³ and time as minutes, so that the concentration time (Ct) is expressed as mg.min.m⁻³.
- e. LCt50. The LCt (lethal concentration time)50 is the Ct which will kill 50% of the exposed population.
- f. ICt50. The ICt (incapacitating concentration time)50 is the Ct which will incapacitate 50% of the exposed population.