**SUPPLEMENTAL APPENDIX 1**

Table 1. Data Characteristics

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **First author and year** | **Country requiring response** | **Type of hazard** | **Study Design** | **Year of hazard/ disaster** | **Participant(s)** | **Type of response team** | **Knowledge/skill(s) discussed** | **Role(s) discussed** |
| Adane 202223 | Sudan | Meteorological & Hydrological; Societal | Field report | 2022 | Pharmacist | INGO | No | Yes |
| AHCMedia 200524 | USA | Meteorological & Hydrological | Field report | 2005 | Pharmacist | EMT | Yes | Yes |
| Ahmerraza 202125 | USA, China, Canada, Middle East | Meteorological & Hydrological; Geohazards; Environmental; Biological | Review | All | Pharmacist | EMT; NGO; UN Agency | Yes | Yes |
| Alkhalili 201726 | Canada | All | Review | 2017 | Pharmacist; Pharmacy student | EMT | Yes | Yes |
| Angelo 201127 | Haiti; USA; Peru | Meteorological & Hydrological; Geohazards; Biological | Review | All | Pharmacist; Pharmacy student | EMT | Yes | Yes |
| Baig 202028 | India | All | Observational; Review | 2020 | Pharmacist | EMT | Yes | Yes |
| Baldi 201929 | Bahamas | Meteorological & Hydrological | Field report | 2019 | Pharmacist | INGO | No | Yes |
| Bratberg 200530 | USA | Meteorological & Hydrological | Descriptive | 2005 | Pharmacist | EMT | Yes | Yes |
| Burnweit 201131 | Haiti | Geohazards | Descriptive | 2010 | Pharmacist | INGO | No | Yes |
| Cohen 200332 | USA | Biological | Descriptive | 2010 | Pharmacist | EMT | Yes | Yes |
| Currier 200633 | USA | Meteorological & Hydrological | Descriptive | 2005 | Pharmacist | NGO | Yes | Yes |
| Feret 201234 | USA | Biological | Descriptive | 2001 | Pharmacist | EMT | Yes | Yes |
| Gaudette 200235 | USA | Societal | Descriptive | 2001 | Pharmacist | EMT | Yes | Yes |
| Gershgol 20084 | USA | Environmental | Field Report | 2007 | Pharmacy student | EMT | Yes | Yes |
| Haffer 200236 | USA | Biological | Brief Report | 2001 | Pharmacist | EMT | Yes | Yes |
| Hassali 201637 | Malaysia | All | Review | 2016 | Pharmacist | EMT | Yes | Yes |
| Hortman 202038 | Bahamas | Meteorological & Hydrological | Field Report | 2019 | Pharmacist | INGO | No | Yes |
| Kawataba 201339 | Japan | Geohazards | Descriptive | 2011 | Pharmacist | EMT | Yes | Yes |
| Kobayashi 201240 | Japan | Geohazards | Presentationreport | 2011 | Pharmacist | NGO; INGO | Yes | Yes |
| Montello 200241 | USA | Biological | Descriptive | 2001 | Pharmacist | EMT | Yes | Yes |
| Rasheed 201942 | USA; Africa; Sierra Leone; Pakistan; Afghanistan; Iraq; Sudan; Serbia; India; Lithuania; Bosnia Herzegovina; Armenia; Indonesia; Sri Lanka; Jordan; Germany; Canada | All | Review | All | Pharmacist | EMT; NGO; INGO | Yes | Yes |
| Risoldi 201243 | Indonesia | Meteorological & Hydrological; Geohazards | Field Report | 2012 | Pharmacist | INGO | No | Yes |
| Setlak 200444 | USA | Biological | Review | 2001 | Pharmacist; Pharmacy student | EMT | Yes | Yes |
| Shrestha 201945 | Nepal | Geohazards | Descriptive | 2015 | Pharmacist | EMT | Yes | Yes |
| Thompson 200446 | USA | All | Commentary | All | Pharmacist; Pharmacy student | EMT | Yes | Yes |
| Thompson 201047 | USA | Meteorological & Hydrological | Brief Report | 2009 | Pharmacist | EMT | Yes | Yes |
| Traynor 200848 | USA | Meteorological & Hydrological | Commentary | 2005 | Pharmacist | EMT | Yes | Yes |
| Traynor 201749 | USA | Meteorological & Hydrological | Commentary | 2017 | Pharmacist | EMT | Yes | Yes |
| Vardanyan 201850 | Brazil; Kenya; Sub-Saharan Africa; Afghanistan | All | Review | All | Pharmacist | INGO | Yes | Yes |
| Velazquez 200613 | USA | Meteorological & Hydrological | Descriptive | 2005 | Pharmacist | EMT | Yes | Yes |
| Villacorta-Linaza 200951 | Afghanistan; Pakistan | Geohazards; Societal | Descriptive | 2005; 2007 | Pharmacist | INGO | Yes | Yes |
| Watson 201952 | Australia; New Zealand; UK; ISA; Europe | All | Review | All | Pharmacist; Pharmacy student | EMT; NGO; INGO | Yes | Yes |
| Young 200353 | Saudi Arabia; Afghanistan; USA | Meteorological & Hydrological; Societal | Field Report | All | Pharmacist | EMT | Yes | Yes |
| Young 200554 | USA | Meteorological & Hydrological | Research Letter | All | Pharmacist; Pharmacy student | EMT | No | Yes |
| Young 200555 | USA | Meteorological & Hydrological | Commentary | 2005 | Pharmacist | EMT | Yes | Yes |
| Young 200656 | USA | Meteorological & Hydrological | Field Report | 2005 | Pharmacist | EMT; NGO | No | Yes |

Table 2. Data extraction table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Study ID | Hazard resulting in disaster | Type of EMT | Roles and Requirements theme | Roles and Requirements Subtheme | SKILLS AND KNOWLEDGE THEMES | SKILLS AND KNOWLEDGE SUBTHEMES |
| Adane 2022 23 | * Meteorological & Hydrological * Societal | * INGO | * Supply chain management |  |  |  |
| AhcMedia 2005 24 | * Meteorological & Hydrological | * EMT | * Supply chain management |  |  |  |
| * Direct patient care | * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions |  |
| Ahmer-Raza 2021 25 | * Meteorological & Hydrological * Geohazards * Environmental * Biological | * EMT * NGO * United Nations Agency | * Supply chain management | * Uphold and ensure policy, legal and financial legislation. |  |  |
| * Direct patient care | * Medicine administration * Patient counselling & education * Management and assessment of diseases and health conditions * Psychosocial support | * Knowledge of diseases and health conditions | * Vaccination * CBRN & toxicology * First response training |
| * Stakeholder collaboration and liaison | * SOP procedure development and consultation. * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| Alkhalili 2017 26 | * All | * EMT | * Supply chain management | * Mass dispensing * Uphold and ensure policy, legal and financial legislation. * Database management | * Good use and knowledge of IT systems * Knowledge of national and international legislation and policies related to pharmacists and medicines. |  |
| * Direct patient care | * Patient counselling & education * Psychosocial support * Public health promotion * Management and assessment of diseases and health conditions * Consultation with MDT on patient care plans | * Knowledge of diseases and health conditions | * Infectious disease medicine * Critical care medicine * CBRN & toxicology * First response training * Vaccination |
| * Stakeholder collaboration and liaison | * SOP development and consultation. |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team | * Management and leadership skills |  |
| * Response management and coordination (ICS) | * Situational analysis and risk assessments | * Disaster and emergency medicine training |  |
| Angelo 2011 27 | * Meteorological & Hydrological * Geohazards * Biological | * EMT | * Supply chain management | * Mass dispensing | * Knowledge of national and international legislation and policies related to pharmacists and medicines |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team | * Management and leadership skills |  |
| * Patient care | * Medicine administration * Prescribing medicines * Management and assessment of diseases and health conditions * Patient counselling & education * Public health promotion | * Knowledge of diseases and health conditions * Disaster and Emergency Medicine training | * Dermatology * Infectious disease medicine * Wound care * Respiratory medicine * Psychiatric medicine * Public health medicine * CBRN & toxicology * Laboratory result monitoring * Vaccination * First response training |
| Baig 2020 28 | * All | * EMT | * Supply chain management | * Mass dispensing * Uphold and ensure policy, legal and financial legislation |  |  |
| * Response management and coordination (ICS) |  |  |  |
| * Patient care | * Public health promotion * Patient counselling & education * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * CBRN & toxicology * First response training |
| * Stakeholder collaboration and liaison | * Liaison with government organizations, NGOs and private-for-profit organizations * SOP development and consultation. |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team |  |  |
| Baldi 2019 29 | * Meteorological & Hydrological | * INGO | * Supply chain management |  |  |  |
| Bratberg 2005 30 | * Meteorological & Hydrological | * EMT | * Supply chain management | * Medicine substitution |  |  |
| * Direct patient care | * Patient counselling & education * Medicine administration | * Knowledge of diseases and health conditions |  |
| Burnweit 2011 31 | * Geohazards | * INGO | * Establishment and operationalization of pharmacy |  |  |  |
| * Supply chain management |  |  |  |
| Cohen 2003 32 | * Biological | * EMT | * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Establishment and operationalization of pharmacy | * Management and leadership of a team |  |  |
| * Supply chain management |  |  |  |
| * Response management and coordination (ICS) | * Situational analysis and risk assessments | * Disaster and emergency medicine training |  |
| * Direct patient care | * Patient counselling & education * Consultation with MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Critical care medicine * Infectious disease medicine, * Psychiatric medicine * CBRN & toxicology |
| Currier 2006 33 | * Meteorological & Hydrological | * NGO | * Supply chain management | * Management of donations |  |  |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team | * Management and leadership skills |  |
| * Direct patient care | * Patient counselling & education * Medicine administration | * Disaster and emergency medicine training |  |
| Feret 2012 34 | * Biological * Societal | * EMT | * Supply chain management |  |  |  |
| * Direct patient care | * Patient counselling & education * Medicine administration * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions | * CBRN & toxicology * Vaccination |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team |  |  |
| * Stakeholder liaison and collaboration |  |  |  |
| Gaudette 2002 35 | * Societal | * EMT | * Establishment and operationalisation of pharmacy |  |  |  |
| * Supply chain management | * Compounding * Medicine substitution |  |  |
| * Patient care | * Medicine administration | * Knowledge of diseases and health conditions * Disaster and Emergency Medicine training | * Public health medicine * Infectious disease medicine * Pharmacokinetic and pharmacodynamic knowledge |
| Gershgol 2008 4 | * Environmental | * EMT | * Supply chain management | * Mass dispensing |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team | * Leadership |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation |  |  |
| * Direct patient care | * Medication reconciliation * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * First response training |
| Haffer 2002 36 | * Biological | * EMT | * Establishment and operationalisation of pharmacy |  |  |  |
| * Supply chain management |  |  |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation. |  |  |
| * Direct patient care | * Patient counselling & education * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Pharmacokinetic and pharmacodynamic knowledge * First response training * CBRN & toxicology |
| Hassali 2016 37 | * All | * NGO * INGO | * Supply chain management | * Quality control and assurance |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team |  |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation. |  |  |
| * Direct patient care | * Psychosocial support * Public health promotion * Patient counselling & education | * Knowledge of diseases and health conditions | * Infectious disease medicine * public health medicine |
| Hortman 2020 38 | * Meteorological & Hydrological | * INGO | * Establishment and operationalisation of pharmacy | * Management of drug destruction |  |  |
| * Direct patient care | * Consultation with MDT on patient care plans |  |  |
| * Supply chain management | * Management of donations * Quality control and assurance |  |  |
| Kawataba 2013 39 | * Geohazards | * EMT | * Supply chain management | * Medicine substitution |  |  |
| * Establishment and operationalisation of pharmacy |  |  |  |
| * Direct patient care | * Medicine administration * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions | * Public health medicine |
| Kobayashi 2012 40 | * Geohazards | * NGO * INGO | * Supply chain management | * Management of donations | * Medical logistics training |  |
| * Direct patient care | * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions | * Public health medicine * Sexual & reproductive health medicine |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations * SOP development and consultation. |  |  |
| * Establishment and operationalisation of pharmacy | * Management of drug destruction * Management and leadership of a team | * Management and leadership skills |  |
| * Response management and coordination (ICS) | * Situational analysis and risk assessments | * Disaster and emergency medicine training |  |
| MONTELLO  2002 41 | * Biological | * EMT | * Direct patient care | * Patient counselling & education * Management and assessment of diseases and health conditions * Medicine administration * Psychosocial support | * Knowledge of diseases and health conditions | * Epidemiology * CBRN & toxicology * Psychological first aid * First response training |
| * Supply chain management | * Medicine substitution * Database management |  |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation. |  |  |
| Rasheed 2019 42 | * All | * EMT * NGO * INGO | * Supply chain management | * Management of donations * Mass dispensing * Quality control and assurance * Database management |  |  |
| * Establishment and operationalization of pharmacy |  |  |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation. * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Direct patient care | * Patient counselling & education * Public health promotion * Management and assessment of diseases and health conditions * Consultation with MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Epidemiology * CBRN & toxicology * Infectious disease medicine |
| Risoldi 2012 43 | * Meteorological & Hydrological; Geohazards | * INGO | * Supply chain management | * Management of donations |  |  |
| * Direct patient care | * Patient counselling & education |  |  |
| Setlak 2004 44 | * Biological | * EMT | * Supply chain management | * Mass dispensing * Medicine substitution * Database management | * Knowledge of national stockpile inventory | * Knowledge of weapons of mass destruction |
| * Direct patient care | * Patient counselling & education * Management and assessment of diseases and health conditions * Medicine administrationConsultation with MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Infectious disease medicine * Epidemiology * CBRN & toxicology * First response training * Vaccination |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations * SOP development and consultation. |  |  |
| * Establishment and operationalisation of pharmacy |  |  |  |
| Shrestha 2019 45 | * Geohazards | * EMT | * Response management and coordination (ICS) | * Situational analysis and risk assessments |  |  |
| * Direct patient care | * Prescribing medicines * Search and rescue. * Public health promotion |  |  |
| * Supply chain management | * Quality control and assurance |  |  |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| Thompson 2004 46 | * All | * EMT | * Supply chain management |  |  |  |
| * Direct patient care | * Management and assessment of diseases and health conditions | * Disaster and emergency medicine training * Knowledge of diseases and health conditions | * Public health medicine |
| Thompson 2010 47 | * Meteorological & Hydrological | * EMT | * Supply chain management | * Medicine substitution | * Medical logistics training |  |
| * Direct patient care | * Medicine administration * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions | * Pharmacokinetic and pharmacodynamic knowledge |
| * Stakeholder liaison and collaboration | * SOP development and consultation. * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Establishment and operationalisation of pharmacy |  |  |  |
| Traynor 2008 48 | * Meteorological & Hydrological | * EMT | * Direct patient care | * Management and assessment of diseases and health conditions * Patient counselling & education * Medicine administration | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Infectious disease medicine * Public health medicine * CBRN & toxicology |
| * Supply chain management | * Medicine substitution |  |  |
| Traynor 2017 49 | * Meteorological & Hydrological | * EMT | * Direct patient care | * Medication reconciliation * Patient counselling & education * Consultation with MDT on patient care plans | * Disaster and emergency medicine training |  |
| * Supply chain management | * Database management | * Good use and knowledge of IT systems |  |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| Vardanyan 2018 50 | * All | * INGO | * Supply chain management | * Uphold and ensure policy, legal and financial legislation. * Management of donations * Medicine substitution * Database management | * Knowledge of national and international legislation and policies related to pharmacists and medicines |  |
| * Direct patient care | * Public health promotion * Patient counselling & education * Medicine administration * Management and assessment of diseases and health conditions * Consultation with MDT on patient care plans | * Disaster and emergency medicine training * Knowledge of diseases and health conditions | * Humanitarian principles * Epidemiology * Infectious disease medicine * Pediatric medicine * Sexual & reproductive health medicine * First response training * Public health medicine * Vaccination * Pharmacokinetic and pharmacodynamic knowledge |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team * Management of drug destruction | * Management and leadership skills | * HR and financial resource management |
| Velazquez 2006 13 | * Meteorological & Hydrological | * EMT | * Establishment and operationalization of pharmacy | * Management and leadership of a team |  |  |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations * SOP development and consultation. |  |  |
| * Supply chain management | * Quality control and assurance |  |  |
| * Direct patient care | * Medication reconciliation * Management and assessment of diseases and health conditions * Consultation with MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * First response training * CBRN & toxicology |
| Villacorta‐Linaza 2009 51 | * Geohazards; Societal | * INGO | * Supply chain management | * Uphold and ensure policy, legal and financial legislation * Database management | * Knowledge of national and international legislation and policies related to pharmacists and medicines |  |
| * Stakeholder liaison and collaboration | * SOP development and consultation. * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Establishment and operationalisation of pharmacy | * Management and leadership of a team |  |  |
| * Direct patient care | * Public health promotion * Patient counselling & education | * Knowledge of diseases and health conditions | * Public health medicine * Infectious disease medicine * Epidemiology |
| Watson 2019 52 | * All | * EMT * NGO * INGO | * Supply chain management | * Mass dispensing * Management of donations * Quality control and assurance * Medicine substitution | * Knowledge of national stockpile inventory |  |
| * Establishment and operationalization of pharmacy |  |  |  |
| * Direct patient care | * Medication reconciliation * Psychosocial support * Management and assessment of diseases and health conditions * Medicine administration * Patient counselling & education * Public health promotion * Prescribing medicines * Consultation with MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Public health medicine * CBRN & toxicology * First response training * Psychological first aid * Vaccination |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations * SOP development and consultation |  |  |
| Young 2003  53 | * Meteorological & Hydrological * Societal | * EMT | * Establishment and operationalisation of pharmacy |  |  |  |
| * Supply chain management | * Database management * Quality control and assurance |  |  |
| * Direct patient care | * Management and assessment of diseases and health conditions | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * Vaccination * Infectious disease medicine * CBRN & toxicology |
| Young 2005 54 | * Meteorological & Hydrological | * EMT | * Supply chain management | * Mass dispensing |  |  |
| * Establishment and operationalisation of pharmacy |  |  |  |
| Young 2005  55 | * Meteorological & Hydrological | * EMT | * Establishment and operationalisation of pharmacy |  |  |  |
| * Direct patient care | * Management and assessment of diseases and health conditions * Consultation with physicians and MDT on patient care plans | * Knowledge of diseases and health conditions * Disaster and emergency medicine training | * First response training * Infectious disease medicine * Vaccination |
| * Supply chain management |  |  |  |
| Young 2006 56 | * Meteorological & Hydrological | * EMT * NGO | * Supply chain management | * Quality control and assurance * Management of donations |  |  |
| * Direct patient care | * Management and assessment of diseases and health conditions * Prescribing medicines * Patient counselling & education * Consultation with physicians and MDT on patient care plans |  | * Vaccination |
| * Stakeholder liaison and collaboration | * Liaison with government organizations, NGOs and private-for-profit organizations |  |  |
| * Establishment and operationalization of pharmacy |  |  |  |