# Evidence-Based Decision-Making (Part II): Applications in Disaster Relief Operations

David A. Bradt, MD, MPH, FACEM, FAFPHM, FAAEM, DTM&H

Center for Refugee and Disaster Response,
Johns Hopkins Medical Insitutions,
Baltimore, Maryland USA

Correspondence:
David A. Bradt
Center for Refugee and Disaster Response
Johns Hopkins Medical Insitutions
Marburg B-187
600 North Wolfe Street
Baltimore, Maryland 21287-2080 USA
E-mail: dbradt@jhsph.edu

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**Keywords:** decision-making; disaster; evidence; evidence base; evidence-based medicine; humanitarian assistance

**Abbreviations:**
GHD = Good Humanitarian Donor
IDP = internally displaced person
IFRC = International Federation of the Red Cross
MEDS = minimum essential data set
NGO = non-governmental organization
OCHA = Office for Coordination of Humanitarian Affairs
REA = Rapid Epidemiological Assessment
USAID = United States Agency for International Development
WASH = water, sanitation, and hygiene
WFP = World Food Programme

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## Abstract

Recognized limitations to data in disaster management have led to dozens of initiatives to strengthen data gathering and decision-making during disasters. These initiatives are complicated by fundamental problems of definitions of terms, ambiguity of concepts, lack of standardization in methods of data collection, and inadequate attempts to strengthen the analytic capability of field organizations. Cross-cutting issues in needs assessment, coordination, and evaluation illustrate additional recurring challenges in dealing with evidence in humanitarian assistance. These challenges include lack of agency expertise, dyscoordination at the field level, inappropriate reliance on indicators that measure process rather than outcome, flawed scientific inference, and erosion of the concept of minimum standards.

Decision-making in disaster management currently places a premium on expert or eminence-based decisions. By contrast, scientific advances in disaster medicine call for evidence-based decisions whose strength of evidence is established by the methods of data acquisition. At present, disaster relief operations may be data driven, but that does not mean that they are soundly evidence-based.

Options for strengthening evidence-based activities include rigorously adhering to evidenced-based interventions, using evidence-based tools to identify new approaches to problems of concern, studying model programs as well as failed ones to identify approaches that deserve replication, and improving standards for evidence of effectiveness in disaster science and services.

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## Present Practices in Managing Disaster Information

The humanitarian community uses many approaches to evidence. Representative initiatives are listed in Table 1. The many different data gatherers, managers, users, and donors have prompted recent efforts to inventory and critique these varied approaches. In October 2007, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) began a two-year, multi-sectoral study of Assessment and Classification of Emergencies (ACE). The Terms of Reference for the study identified 17 global initiatives relevant to emergency assessment and analysis.[1] In the Terms of Reference, OCHA expressed concern that common definitions of basic terms of the trade are not well-established in the humanitarian community. It noted that ambiguity surrounds terms such as "humanitarian crisis/emergency", "vulnerable group", "affected population", and "evidence" or "evidence-based". Moreover, it asserted that "the lack of standardized and universally accepted definitions and indictors leads to inconsistency in humanitarian action with similar levels of vulnerability in different settings triggering different levels of response."

In September 2006, the Dartmouth Medical School and Harvard University co-sponsored a multi-agency conference to examine humanitarian health issues among 51 organizations including 24 operational non-governmental organizations (NGOs). A workgroup on health tracking for improved humanitarian performance identified 11 initiatives to manage humanitarian



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| Initiative | Initiator/Sponsor | Application/Goal |
|---|---|---|
| Complex Emergencies Database (CE-DAT) Emergencies Database (EM-DAT) | Center for Research on the Epidemiology of Disasters with funding by the US Department of State for CE-DAT; and IFRC, WHO, ECHO for EM-DAT | Store, analyze, and disseminate quantitative and qualitative information on complex emergencies (CE-DAT) and non-conflict disasters (EM-DAT) largely from field sources |
| Cluster-Specific Assessment Tools—Health and Water/Sanitation | Multi-agency associated with Health and Water/Sanitation clusters | Access peri-disaster health and nutrition sectors |
| Early Recovery Local Level Needs Assessments | Cluster Working Group on Early Recovery | Develop assessment tool for early recovery or identify existing tools appropriate for the task |
| Emergency Info | DevInfo | Provide decision support system within 72 hours of emergency |
| Famine Early Warning System (FEWS) | US Agency for International Development (USAID) | Analyze humanitarian emergencies focusing on food insecurity, risk, and vulnerability |
| Food Insecurtiy and Vulnerability Information and Mapping Systems (FIVIMS) | Interagency Working Group comprised of 3 United Nations agencies | Improve data capture, analysis, and use in countries with food insecurity and nutritional crises |
| Global Information and Early Warning Systems | Food and Agriculture Organization (FAO) | Analyze humanitarian emergencies focusing on food insecurity, risk, and vulnerability |
| Health and Nutrition Tracking Service (HNTS) | World Health Organization (WHO) | Track health and nutrition indicators as well as assessments and surveys in high-risk areas |
| ICRC Tracking Strategy | International Committee of the Red Cross (ICRC) | Assess effect of conflict in pastoralist areas on animal herd numbers, feed supply, etc. |
| IDP Assessment | Norwegian Refugee Council, OCHA | Assess IDP situations and needs |
| Integrated Food Security and Humanitarian Phase Classification (IPC) | FAO | Develop global classification system building upon work of FAO's Food Security Analysis Unit (FSAU) in Somalia |
| Immediate Rapid Assessment (IRA) | Multi-agency associated with Nutrition Cluster | Assess peri-disaster food security and potentially other sectors |
| Integrated Rapid Livelihoods Assessment Guidelines (IRLAG) | FAO | Assess livelihoods in context of natural disasters focusing on baseline with follow-up within days after disaster |
| Livestock Emergency Guidelines (LEGS) | Tufts, USAID | Develop management guidelines for livestock in emergency settings |
| Needs Analysis Framework (NAF) | Office for the Coordination of Humanitarian Affairs (OCHA) | Help UN country teams link needs assessments to program planning and resource mobilization in their catchment areas |
| Nutritional Information Project for the Horn of Africa (NIPHORN II) | United Nation's Children's Fund (UNICEF) | Improve nutritional surveys in the Horn of Africa |
| Post-Conflict Needs Assessments (PCNAs) or Joint Needs Assessments (JNAs) | World Bank | Identify needs and produce a recovery plan for countries emerging from conflict |
| Post-Disaster Needs Assessment Cluster Tools (PDNAs) | World Bank | Apply PCNAs to the natural disaster context |
| Protection Needs Assessment Framework | UNHCR, Protection Cluster Working Group | Develop needs assessment framework for protection |
| Strengthening Emergency Needs Assessment Capacity (SENAC) | Multiple donors | Improve WFP's emergency needs assessment capacity |
| SMART—Standardized Monitoring and Assessment of Relief and Transitions | USAID, US Department of State PRM, Canadian International Development Agency (CIDA) | Develop a standardized methodology to measure population mortality, nutritional status, and food security |
| Vulnerability and Mapping (VAM)/Emergency Needs Assessment | World Food Programme (WFP) | Collect and analyze primary data on food insecurity and population vulnerability generally at country level |

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**Table 1**—Representative initiatives in managing humanitarian information[1,2]



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information grouped around five overlapping major themes: (1) emphasis on standardizing indicators and data collection methods; (2) early warning systems and primary data collection; (3) integrated frameworks for data collection and analysis; (4) national-regional analyses; and (5) distributive databases for maps and other datasets.[2] The workgroup expressed concern for the lack of standardization in methods of data collection, the lack of systematic attempts to strengthen field organizations' capacities to collect and process the data needed for humanitarian actions, and the virtual absence of primary data collection programs for systematically tracking health and nutrition.[2]

## Application to Disasters

*Generic Issues*

Important questions in disasters are not easily testable by evidence-based science. Examples include:

1. Is the area secure?
2. What do the beneficiaries need?
3. How are the beneficiaries doing?
4. Why is this program faring so poorly?

Such questions are not easily presented in PICO strucure, and thus, do not easily lend themselves to the sort of evidence-based studies prized in "evidence-based" systems.[3]

Data gathering for high-quality studies during disasters is hampered by logistical limitations. Particularly during conflict situations, and also acute relief situations, organized studies are difficult to conduct. Security issues may preclude the extensive field presence required for survey-based epidemiological methods. Longitudinal studies may incur extensive loss of participants in follow-up. The basis on which relief actors determine who is vulnerable in order to identify needs and prioritize allocation of resources is currently part of OCHA's working definition of "evidence-based". The *modus operandi* in humanitarian assistance continues to emphasize cooperation, coordination, consensus, communication, and assessment (C4A).[4]

As a consequence, expert opinion retains a prominent place in decision-making. There is much overlap in the roles of experts in evidence-based medicine and in humanitarian assistance. They both serve to bridge external evidence with the needs of beneficiaries. However, evidenced-based medicine affirms the ascendancy of evidence-based judgments over personal judgments regardless of how eminence-based they may be. By contrast, humanitarian assistance continues to rely heavily on eminence-based decisions. This tendency was recognized in the Humanitarian Response Review of 2005, commissioned by OCHA, which stated:

> *...the international humanitarian coordination system works by goodwill and consensus and depends too often on the authority and skills of HCs [humanitarian coordinators]. While its role has to be maintained and reinforced, there is also a need to make progress in designing a more explicit model where, sector operational accountability will be clearly identified at the level of a designated organization, following standards to be agreed upon. Responsibilities to be covered under such a model are: (a) planning and strategy development, (b) standard-setting, (c) implementation and monitoring, (d) advocacy.*[5]

Selected issues from a case report as well as cross-cutting functions in the field are considered below.

*Selected Field Issues from a Case Report*

Many of the challenges of dealing with "evidence" are illustrated in field reports from disaster settings. The Darfur Humanitarian Profiles are a rich source of examples. One issue from October 2004 yields the following extracts.[6]

The section on the conflict-affected population contains the paragraph:

> *The Humanitarian Profile includes in its estimate of conflict affected people almost exclusively those assessed by international humanitarian agencies and their implementing partners, mostly through WFP food registration. On rare occasions it includes also OCHA estimates based on credible sources other than those mentioned above. The figures in this Profile are thus closely aligned with those of WFP... Similar to WFP, 99% of the estimated conflict affected population presented here is either in the IDP or host community category, residing mainly in urban or camp settlements. Efforts to further improve and streamline registration procedures are currently being undertaken, are of critical importance, and may in turn result in revised figures based on improved registration figures.*

*Insight*—The World Food Programme (WFP) based its population estimates on "vulnerability assessment and monitoring" (VAM) activities for the beneficiary populations. Estimates of the size of the population were not included in WFP food registrations. The WFP explicitly stated that it had not estimated the internally displaced person (IDP) population in the Nyala peri-urban area because it had not "validated" its methodology for that setting. Hence, a population obviously present in south Darfur did not get included in the beneficiary population estimates. The net effect is that service coverage rates in Nyala area are falsely elevated.

The Nutrition Section contains findings from a NGO nutrition survey that indicated that 23.6% of children <5 years of age in Kalma camp were malnourished, and 3.3% of them were severely malnourished.

*Insight*—The Nutrition Survey was irrelevant to the management decision to stand up a therapeutic feeding center (TFC) in the camp. The TFC was a going concern when the survey was undertaken. The logic was put forward that the survey established a baseline for the camp against which follow-up survey results could be measured. While this may make sense in isolation, for the camp inhabitants, the nutrition survey was one of three nearly concurrent surveys imposed on them by the relief community. Two other surveys originated with the WHO seeking to determine beneficiary population sizes for bed net distribution and a cholera vaccination campaign. Thus, a follow-up nutritional survey to demonstrate an impact on the camp would have become the fourth camp survey.

The Health Section reports that two indictors were used to measure primary healthcare coverage—access to primary health care facilities and availability of basic drugs.



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*Insight*—The report comments on two metrics leading to impressions in gaps of service availability, but no insight to the adequacy of the primary care services rendered. For example, the NGO charged with camp management at Kalma in South Darfur failed to organize measles immunization for newly arrived IDPs. Measles immunization of IDPs in low coverage areas is one of the most cost-effective interventions in the biomedical arsenal. Measles immunization has been generically considered as the most urgent relief consideration following initial assessment.[7] Failure to immunize against measles of at-risk populations is a cardinal violation of best practices in refugee/IDP health care.

The Water and Sanitation Section contains the following assertion: "The outbreak of acute jaundice/hepatitis E in late August until mid-September reflected this [Wat-San coverage] gap as did the WHO mortality survey released in September which indicated that diarrhea was the main cause of death between 15 June and 15 August. Hepatitis E cases have however, decreased in most camps due to the rapid and effective response from agencies."

*Insight*—This assertion declares causation between agency response and decline in hepatitis E cases. There are not enough data to demonstrate causation. In fact, the hepatitis epidemic was tracked in July 2004 from two refugee camps in Chad to an IDP camp in West Darfur.[8] The epidemic swept through the other Darfur states and peaked in late August–early September. The decrease in cases noted by the time of this report is most consistent with a predictable decline in the epidemic curve of a transmissible fecal-oral pathogen: the vulnerable population in the catchment area was exposed, some of the non-immune became infected, and some of the infected became ill. The agencies' response probably had little to do with it.

The section on Humanitarian Needs and Gaps provides data on percent of the population assisted in tabular and S-bar graphic formats.

*Insight*—The data on assistance do not quantify the adequacy of that assistance—specifically, whether minimum standards codified in the Sphere Project[9] were met. Use of percent assisted as a metric of relief success constitutes an erosion of the principle of Minimum Standards. Until progress toward minimum standards is quantitatively addressed, it is impossible to calculate the magnitude of unmet need.

Thus, the technical problems with "evidence" in humanitarian assistance stems from a wide range of underlying issues. These issues include:

1. Lack of agency expertise;
2. Dyscoordination between agencies in the field;
3. Inappropriate proxy indicators;
4. Flawed scientific inference; and
5. Erosion of the concept of minimum standards.

Additional evidence is not required to fix many of these underlying problems. Existing knowledge is entirely adequate to address many of them. The solutions, in these cases, require compliance with well-established best practices. An extensive review of needs assessment found that most of those interviewed for the study felt that knowledge and evidence were not the main limiting factors to appropriate humanitarian response.[10] Rather, it was the [lack of] political and organizational will to act on that knowledge, and to deploy the necessary resources to tackle problems using the best available solutions.

*Selected Cross-Cutting Issues*

There are specific cross-cutting issues in humanitarian assistance for which enhanced evidence may improve the process and potentially the outcomes.

*Needs Assessment*—The scientific literature on needs assessment in humanitarian assistance is extensive. The bibliography encompasses hundreds of field reports, scores of hazard-specific guidance documents, dozens of agency-specific manuals, and multiple ecologic reviews of the discipline. Several major themes in this literature are summarized below.

1. Needs assessment often plays only a marginal role in the decision-making of agencies and donors. Their added value has been negligible.[10,11] Agencies routinely violate their own calls for field-validated needs assessments as a precursor to intervention.
2. Needs assessments are too slow to drive initial humanitarian responses.[11]
3. Needs assessments often are conducted by operational agencies in order to substantiate a request for funds. Hence, they often are seen as the "front-end" of a process that culminates in project design and donor solicitation. Consequently, there are inherent questions of supply-driven responses, the distortion of the scale of the threat, and the importance of the proposed intervention.[10]
4. The mutual tendency of agencies and donors to address crises with little reference to evidence erodes trust in the system and calls for greater emphasis on evidence-based responses.[10,12]
5. The humanitarian aid system has faced comparatively little pressure to demonstrate that its interventions are evidence based, even in the more limited sense of being based on known facts about the scale and nature of the problem at hand.[10]

In this context, the OCHA has identified at least 17 current global initiatives relevant to emergency assessment and analysis.[1] Among them, the current interest in needs assessment by technical workgroups of its Inter-Agency Standing Committee is long overdue. Standardized assessment tools and evidence-based methods that inform the response process remain the holy grail of the assessment community.

The 29 recommendations from the Humanitarian Policy Group,[10] 17 recommendations from the Tsunami Evaluation Coalition,[11] and the 19 recommendations from the Irish Aid review,[12] should be read in full. Selected leadership opportunities relating to evidence and expertise follow.

1. Country background data are necessary precursors to disaster needs assessment data. In the health sector, for example, a country's pre-disaster health infrastructure, medical logistics mechanisms, and disease surveillance system must be understood by persons undertaking a post-disaster needs assessment. This informs the



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"before-disaster" picture against which the post-disaster picture is compared. However, gathering this background country data often becomes an additional burden in the acute disaster setting. Among members of the response community, there is too much duplication as well as practice variation. The humanitarian community must insist that concise, well-organized background country data be available from responsible stakeholders whether compiled at international, regional, or country level. The locus of control is not important. What is important is the responsibility to provide state-of-the-art background data to responders during a disaster.

2. Defining the mission is fundamental. During disasters, doing the most good for the most people remains paramount with the emphasis on the most vulnerable. Success is the ability to graduate from humanitarian aid to marginal self-sufficiency. Unfortunately, mission creep in disaster relief may mean a departure from doing the most for the most to attempting the needful for all. This mission creep has many drivers, including advocacy groups that focus exclusively on the needs of indiviuals or minority client populations at the expense of overarching public health needs. Decision-makers can help to ensure that disaster relief focuses on the big picture—restoring marginal self-sufficiency to the population at large. The implications for information management are obvious. Information has granularity—context-specific level of detail. Field data on beneficiaries may focus on a village of 250 people or a displacement of 250,000 people. Needs assessors can insist that data acquisition, particularly early during the relief operation, remains focused on information requirements of lifesaving interventions that do the most good for the most people.
3. While well-established mechanisms exist for interagency needs assessment, needs assessments verified by host governments are routinely pre-empted by donors in their haste to intervene. This haste takes several forms—in the health sector, for example, by the emergence of the field/floating hospital. The Indonesian experience provides illustrative examples.
   a. Donors mobilize a field hospital based upon a solicitation for aid from an umbrella organization the donor chooses to recognize.
      *Example:* after the Bengkulu, Sumatra earthquake of 2001, the International Federation of the Red Cross publicized an appeal within 48 hours for millions of dollars ostensibly in support of the Indonesian Red Cross. A northern European donor government mobilized a field hospital that arrived before the United Nations Disaster Assessment and Coordination (UNDAC) mission had completed its assessment. At the subsequent Inter-Country Meeting on Disaster Preparedness, hosted by the World Health Organization Regional Office for South-East Asia, Indonesian technical experts publicly stated that the host country hospital of concern had remained functional, the imported hospital was unnecessary, and the donation overall was inappropriate.
   b. Donors mobilize military assets based upon intent to support regional allies.
      *Example:* in the aftermath of the Indian Ocean tsunami of 2004, an earthquake struck Nias Island off the coast of Sumatra in 2005. The central government determined that the disaster did not rise to the level of national significance and that the provincial governor would take responsibility for managing it. Nonetheless, a North American donor government dispatched a hospital ship to the area. Two-thirds of its staff were on shore leave. Most of its hospital beds were closed. The ship laboratory declined to assist in evaluation of pathological specimens. The ship arrived one week post-event just as Provincial Health Authorities publicly rejected further offers for imported hospitals.

   While political drivers to humanitarian assistance will certainly persist, the problems illustrated by the examples cited above are under the exclusive control of the donor community.
4. Minimum essential data sets (MEDS) in rapid epidemiological assessment balance competing interests of conciseness and brevity with completeness of understanding.[13] It takes discipline to develop and adhere to the MEDS. Multi-agency participation, shifting priorities, lack of assessment experience, and entropy tend to enlarge the data domains accumulated over time. Donors can help to enhance the utility of needs assessments by insisting that their grantees comply with the developed instruments and pool their findings with the relevant cluster. The OCHA, as purveyor of secondary source information, is in a position to exhort, but not to enforce, compliance with best practices.
5. Information is as important as other resources. Situation reports commonly detail emerging needs for additional material, financial, and human resources. Situation reports less commonly articulate the needs for additional information in their list of resource requirements. Even after initial needs assessment, information priorities can be anticipated. Appropriate data gathering and analysis are best planned. Donors, in particular, can be just-in-time providers of financial, logistical, or telecommunications resources to enable prompt assessments.
6. Data gathering and consequent humanitarian interventions are invasive procedures with unintended consequences. Good intentions do not excuse bad outcomes. Unnecessary data gathering must be rejected in favor of a systematic approach to information management that best serves the entire community. Typically, an NGO will show up at a sector coordination meeting and announce that it will undertake or has undertaken some survey which it offers to share.

   Differences between survey populations, data sources, methods, and confidence intervals often hinder useful aggregation of yet another survey with the existing body



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of knowledge. The opportunity cost and notional transparency may not be worth the putative added value. Often, the survey is relevant only to the organization that performed it. Agencies must be skeptical of survey science as a source of information especially early in a sudden-onset disaster. Once a survey is undertaken, then some form of tracking service, e.g., Health and Nutrition Tracking Service of the WHO may help with peer review, context interpretation, and archiving.

7. Data have metadata. Data obtained by all parties, including donors, ideally are accompanied by details on sources, methods, and limitations to the reliability of what is obtained.

*Coordination*—The scientific literature on coordination of international humanitarian assistance is meager. The bibliography encompasses process guidance from the OCHA,[14] post-disaster evaluations,[15] and occasional reference books.[7] Overall, there is much anecdote, but little evidenced-based science to inform the coordination efforts of the humanitarian community. Within the identified literature, several major themes emerge.

1. Coordination is neither a recognized principle of the Red Cross/Red Crescent and NGO Code of Conduct nor an obligation recognized in the Sphere Standards.
2. The effectiveness and impact of coordination are difficult to quantify.
3. Benchmarks for collective action have yet to be developed.
4. In the case of the 2004 tsunami, the OCHA lacked the authority to direct activities.
5. Improved efforts are needed to coordinate with the affected communities.
6. Coordination requiring additional controls is not likely to come from the international aid community.

The consequences of poor coordination are easily understood. One of the most insidious is the tendency for early solutions to become permanent. When these solutions do not adequately encompass protection issues, age and gender-associated health risks, equitable access to resources, etc., the consequences are troubling. Cluster leaders are responsible for inter-agency coordination at critical junctures relevant to field practitioners and their beneficiaries. Selected opportunities relating to evidence and expertise follow.

1. *Transition Milestones*—Coordination processes attempt to shepherd the affected population from relief to development. This relief-to-development spectrum, while often characterized as a continuum, may be more productively characterized by incremental milestones. These incremental milestones, in rough chronological order, include:
   a. all major affected jurisdictions are geographically assessed;
   b. all major affected jurisdictions have an identified host country governmental decision-maker on site (or accessible);
   c. all major affected jurisdictions have host country sector-specific administrative leads on site (or accessible) and resourced to resume their work;
   d. all major affected jurisdictions have explicit partnerships between indigenous/international NGOs and local service providers in a given technical sector;
   e. host country sector-specific administrative leads are discharging their routine duties with the production of routine reports; and
   f. host country sector-specific administrative leads are producing their routine reports as well as progressively handling the coordination functions of the relief effort.

   Reaching these milestones is a function of good coordination. Indeed, a major goal of coordination is to enable marginal self-sufficiency of local authorities. Inadequate coordination can impair if not arrest recovery. The following is an example of failed health coordination from the 2004 tsunami.

> *The director of the Aceh Jaya District Health Office lived and worked out of a tent with his staff long after the relief community worked from container offices and lived in imported compounds complete with baffled air-conditioning, portable toilets, reticulated water supply, hot meals, and satellite communication. The district health officials, while fully competent and creative, were inadequately resourced to address the health issues of their district much less produce routine written reports of their profession. Stated differently, the WHO, the UN technical lead agency for health, while fully engaged with national and provincial health authorities, failed to restore the marginal self-sufficiency of district health authorities for months after the disaster.*

   Intervenors can foster inter-agency coordination first by recognizing these milestones and treating them as performance benchmarks.
2. *Tools*—The written work products of cluster coordinators remain variable. Much more progress can be made in standardizing these work products in clear and concise ways. Certain sectors, like health, have very stylized formats for data presentation that conform to international best practices. Nonetheless, for most sectors, and for the relief effort as a whole, periodic situation reports serve as typical information tools. Sector coordinators writing such reports have a three-fold opportunity:
   a. the leadership opportunity to quickly demonstrate an ability to organize cross-cutting information relevant to numerous stakeholders in the disaster response;
   b. the strategic opportunity to shape the optics of disaster relief by proper prioritization of relief issues; and
   c. the tactical opportunity to quickly orient fellow sector actors among organizations newly arriving in the field.

These opportunities appearing after the Java earthquake of 2006 led to a field situation report which included Table 2. This component summary explicitly records data on milestones in disaster relief, status toward achieving those milestones, priority within the relief context, and key contacts. Currently, the United Nations High Commissioner on Refugees (UNHCR) is working to develop 1–2 page displays of time-trend information across various sectors in refugee relief. To this end, there is much to be learned from pioneers in the field of visual display of quantitative information.[16,17]

Donors are in a position to hold accountable those responsible for producing the tools of coordination. The



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| Components of Assistance | Milestones and Benchmarks | Status | Priority/Unmet Need | Lead/Contact |
|---|---|---|---|---|
| *Rapid Epidemiological Assessment* | | | | |
| Beneficiary identification | Complete enumeration | Community outreach underway but no individual registration system at present | High | Bakornas-Satkorlak |
| | Site mapping | Satellite imagery from UNOSAT; hazard maps from ASAID. Mapping of functioning health facilities and homeless populations remains pending | Med | OCHA |
| Rapid epidemiological assessment | Template development | Assessed tools developed | Low | PHO, WHO |
| Assessment priorites | Morbidity and mortality rates | Village and facilities damage assessments done; priorities defined through rate related M&M data pending weekly surveillance reports | High | PHO, WHO |
| *Environmental Health Services* | | | | |
| Water quantity | Minimum standards | Generally adequate | Low | PDAM, UNICEF |
| Water quanitity | Minimum standards | Often inadequate | Med | PDAM |
| Food supply | Minimum standards | Generally adequate | Low | Bulog, WFP |
| Sanitation | Minimum standards | Generally inadequate in disaster-affected areas | Med | PDAM, UNICEF |
| Shelter | Minimum standards | Grossly inadequate in disaster-affected areas | High | |
| Vector control | Service delivery | Service interruption | Med | |
| *Public Health and Clinical Services* | | | | |
| Immunization | Measles coverage rate | Campaign planned | High | PHO, UNICEF |
| | Vitamin A distribution | Campaign planned | High | PHO, UNICEF |
| *Clinical Services* | | | | |
| Mobile clinics | Service delivery | Services intensified for active case finding of traumatic | High | PHO, WHO |
| Puskesmas | Service delivery | Services restarting 26/117 Pkm destroyed | High | PHO, WHO |
| Hospitals | Service delivery | Facilities generally adequate. Services generally adequate except in domain of orthopedics. Additional foreign field hospitals interdirected | High (ortho), otherwise Low | PHO, WHO |

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**Table 2**—Humanitarian health assistance component summary, Yogyakarta Special District, 08 June 2006[34] (M&M = morbidity and mortality; OCHA = Office for the Coordination of Humanitarian Affairs; PDAM = Water Department; PHO = Provincial Health Office; UNICEF = United Nations Children's Fund; UNOSAT = United Nations Institute for Training and Research Operational Satellite Applications Programme; USAID = US Agency for International Development; WFP = World Food Programme; WHO = World Health Organization)
*(continued on page 486)*



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| Components of Assistance | Milestones and Benchmarks | Status | Priority/Unmet Need | Lead/Contact |
|---|---|---|---|---|
| *Public Health and Clinical Services* | | | | |
| Standardized case management | Clinical case definitions | Done | Low | PHO, WHO |
| | Treatment protocols | Documents exist; however compliance with wound care standards suboptimal | High (protocols exist, however compliance variable) | PHO, WHO |
| | Essential drugs | Generally adequate in health centers. Hospitals with gaps in operative resources | Low (However needs exist for selected meds) | PHO, WHO |
| | Referral guidelines | Generally adequate | Low | |
| Reproductive health | Service delivery | Community outreach underway | Med (need professional midwifery, referral process, but not specifically disaster-related) | PHO, UNFPA |
| Maternal-child health | Service delivery | Community outreach underway | Med | PHO, WHO |
| HIV/AIDS | Service delivery | | Low | PHO, WHO |
| Mental health | Service delivery | Community outreach underway | Med | PHO, WHO |
| *Epidemic preparedness* | | | | |
| Communicable diseases of epidemic potential | Clinical case definitions | Done | Low | PHO, WHO |
| | Case management guidelines | Done | Low | PHO, WHO |
| | Specimen collection protocol to follow | Done | Low | PHO, WHO |
| | Reference lab to identify | Done | Low | PHO, WHO |
| | Patients to treat | Referral mechanism being worked out especially for tetanus | High (current focus on tetanus) | PHO, WHO |
| *Communicable disease control* | | | | |
| EPI | National program | Measles campaign restarting | High | PHO, UNICEF |
| Malaria | National program | | Low | PHO, WHO |
| TB | National program | | Low | PHO, WHO |
| Community Health Education | Culturally appropriate messages | Public awareness campaign underway | High | Satkorlak, WHO, USAID |
| Quality improvement | Site monitoring visits | | High | WHO, PHO |
| *Epidemiological Surveillance* | | | | |
| Data source identification | Puskemas level reporting forms | Done | Low | |
| Data management | Data collection and analysis | Data reporting compliance needs enhancement | High | PHO, WHO |
| | Information dissemination | Enhanced surveillance system started; daily and weekly updates | High | PHO, WHO |
| Special surveys | Methodology | None underway | Low | PHO, WHO |

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Table 2—*(continued from page 485)* Humanitarian health assistance component summary, Yogyakarta Special District, 08 June 2006[36] (PHO = Provincial Health Office; UNFPA = United Nations Family Planning Agency; UNICEF = United Nations Children's Fund; USAID = US Agency for International Development; WHO = World Health Organization) *(continued on page 487)*



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| Components of Assistance | Milestones and Benchmarks | Status | Priority/Unmet Need | Lead/Contact |
|---|---|---|---|---|
| *Health Sector Coordination* | | | | |
| Inventory of organizations | Contact list | Done | Low | PHO, WHO |
| Sectoral coordination meetings | Schedule | Done | Low | PHO, WHO |
| Exisiting health system catchments | Defined areas of responsibility | Established | Low | PHO, WHO |
| NGO/agency area-specific task designed | Defined areas of responsibility—Matrix | Needs to be done for organizations supporting hospitals | High | PHO, WHO |
| Drug importation/medical logisics | Defined process | Process is defined, but unsolicitated donations are overloading the systems | High | PHO, WHO |
| Provincial health authority capacity building | Self-sufficient health sector management | Ongoing support to health coordination process | High | WHO |

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Table 2—*(continued from page 486)* Humanitarian health assistance component summary, Yogyakarta Special District, 08 June 2006[36] (PHO = Provincial Health Office; WHO = World Health Organization)

OCHA often is criticized for failures in coordination and broader humanitarian information management. However, the OCHA commonly does a masterful job at managing secondary source information. It only can be as timely and authoritative as the technical sectors that supply it with information. Donors must be much more precise in their expectations of sector/cluster leads and in their analysis of the information they produce. However, donors also need to understand that a comprehensive coordination mechanism does not guarantee good outcomes. Indeed, coordination may be exemplary in the setting of poor outcomes, such as excess mortality. Excess mortality is but one kind of evidence in which the coordination process has not yet achieved important goals.

3. *Professionalization*—With a vulnerable population at hand, complex technical issues in the field, formidable consequences of error, increasing intervenor accountability, and extensive media scrutiny, disaster field operations require multi-disciplinary expertise. Expert opinion is most needed at interfaces of the traditional technical disciplines—e.g., epidemiology and nutrition, shelter and livelihoods, environmental health, and clinical care. Highly evolved, evidence-based, technical disciplines require explicit qualifications of their technical leaders. Technical disciplines commonly have hallmark qualifications obtained through apprenticeship training programs, criterion-referenced examinations, and ongoing peer review. However, disaster management and especially humanitarian assistance are striking for the near absence of criterion-referenced qualifications in their practitioners. Even within the health sector, there currently are no explicit standards for the education, training, or evaluation of health personnel who respond to disasters.[18] Expatriate healthcare providers who work during disasters are often not considered qualified to render an informed opinion in the leading clinical and public health institutions of their home countries. Commitment to best practices obliges a consideration of customary management tools, such as credentialing along with clinical audit, sentinel event analysis, and external peer review.

   Professionalism in disaster response, evidenced by criterion-referenced qualifications and extensive experience of its practitioners, will help foster the proper use of evidence and delivery of essential services to beneficiaries. This is important, especially for cluster leaders who will likely be selected in the future for these attributes. This concept will not be popular either with persons who lack such qualifications or with organizations that routinely employ them. However, international technical organizations and their thought leaders have long made a clarion call for professionalization of disaster personnel.[18,19] Donors have an opportunity through their grants' guidelines to enhance agency technical practices by calling for criterion-referenced qualifications in education and experience of technical staff in the field—particularly those persons holding sector lead or coordination roles. Donors will find it easier to place confidence in the findings of such individuals. Donors do not want to become managers of employment agencies. However, they also don't want to become funders of weak technical programs. Host country authorities and donors both fully realize the implications of a mismanaged disaster. Prolonged displays of mismanaged disasters in their media undermine public confidence in disaster management, in good governance, and in good humanitarian donorship.

*Evaluation*—The scientific literature on evaluation of humanitarian assistance is extensive. Different approaches to evaluation include scientific (relying on quantitative measures), deductive (relying on anthropological and socioeconomic methods), and participatory (relying on views of program beneficiaries).[20] The World Bank defines impact



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evaluation as the systematic identification of the effects—positive or negative, intended or not—on individual households, institutions, and the environment caused by a given development activity such as a program or project.[21]

Several major themes in the evaluation literature include:

1. Appropriate tools and methods exist that can provide reliable analyses of the impact of humanitarian aid;[22] Measures of effectiveness are well-defined in the humanitarian assistance literature as operationally quantifiable management tools that provide a means for measuring effectiveness, outcome, and performance of disaster management;[23]
2. Many donors including the United States Agency for International Development (USAID), UK Department for International Development (DFID), AusAID, European Community Humanitarian Office (ECHO), Canadian International Development Agency (CIDA), and Danish International Development Agency (DANIDA) have adopted results-based management approaches.[22] Extensive analysis of these approaches has revealed numerous concerns including simplistic assumptions of cause and effect, reinforcement of tendencies to apply established approaches at the expense of innovative ones, and neglect of important dimensions of assistance such as protection. Nonetheless, the movement toward evaluation of impact is well-established and growing; and
3. Evaluation experts have begun to apply the tools of classic, evidence-based disciplines, such as randomization, to issues of development.[24]

Evaluation can be expensive and time-consuming. The World Bank describes four types of impact evaluations,[21] which are summarized in Table 3. The World Bank considers Study Types 3 and 4 as rigorous—best able to estimate magnitude of an intervention's impact, establish a causal relationship between the intervention and the impact, and distinguish that causality from confounders. There are numerous methodological challenges with rigorous studies, including choice of comparison (control) group and elimination of bias. Moreover, these methods are expensive—typically costing $200,000–$900,000 per study. With its budget of $23,000,000/year, the Operations Evaluation Department of the World Bank reports that it has conducted 23 rigorous impact evaluations since 1980 and estimates that it can undertake only one rigorous impact evaluation per year.[21]

The many obstacles and few incentives to good evaluation create what some investigators have called an "evaluation gap".[25] The limited corpus of rigorous studies is notable, particularly in fields as diverse as teacher training, student retention, health finance, microfinance programs, and public health messaging. However, the cost of an evaluation is most properly gauged not against the program under study, but against the value of the knowledge it yields. Ultimately, ignorance is considered more expensive than impact evaluation.

Humanitarian assistance post-event seems particularly difficult to rigorously evaluate. The compelling urgency to provide assistance, the difficulty in establishing a post-event and pre-intervention baseline, and the technical and ethical challenges of choosing a disaster-affected, matched, control group all limit such studies. Overall, it appears that study Types 1 and 2 will remain most serviceable in humanitarian assistance. Nonetheless, the paucity of detailed studies is striking, and existing studies provide a rich source of insight. The Tsunami Evaluation Coalition has identified 21 practical implications for reorienting humanitarian practices in light it its findings.[26]

Program monitoring can identify program problems that otherwise would escape attention until evaluation detects them. Moreover, monitoring can help verify progress toward meeting minimum standards. The ideal staff to undertake such monitoring have been described above in the section on Professionalization. An individual donor can do much to facilitate monitoring of the projects it funds. Heretofore, some donors have been willing to fund field projects without monitoring, much less evaluation. Only donors can stop such practices. Further, donors can develop grants guidelines that stipulate a budget line for monitoring and evaluation of their projects. Should local circumstances preclude evaluation of a given project, donor flexibility could enable pooling of monitoring and evaluation funds for efficient, coordinated donor review of projects within a sector or a jurisdiction.

Monitoring is not evaluation. The Evaluation Gap Working Group proposes four core functions that can best help reduce the evaluation gap when undertaken collaboratively.[25] These core functions are:

1. Establishing quality standards for rigorous evaluations;
2. Administering a review process for evaluation designs and studies;
3. Identifying priority topics; and
4. Providing grants for impact evaluation design.

The donor community can take a decisive role in 3 and 4: identifying priority topics as well as providing grants for design of impact evaluation. This leadership opportunity awaiting donors in evaluation is analogous to the leadership opportunity the donors took in the *Standardized Monitoring and Assessment of Relief and Transitions* (SMART) initiative.[27] It was precisely donor leadership that provided the opportunity for groundbreaking technical consensus standards to emerge in nutritional surveys, mortality surveys, and food security assessments. Evaluation holds the same potential.

Donors have fiduciary as well as technical responsibilities that call for a wide range of indicators and metrics. A detailed discussion of indicators and metrics goes beyond the scope of this paper. However, metrics of particular relevance to donors—cost-effectiveness—merit further donor consideration. The Canadian International Development Agency Dollars recently has sponsored a US NGO in community-based health programming that reports its impacts in terms of deaths averted (lives saved).[28] At present, the metric may enrich health sector analysis, especially when triangulated with mortality surveys and vital events registration. In the future, if validated through field application, the metric could enable benchmarking and comparison of projects across jurisdictions and over time.

### Role of Implementing Agencies and Host Country Counterparts

Implementing agencies and host country counterparts work in challenging field contexts. The field context may involve complicated issues surrounding disaster root causes, operational security, transparency of data and action, politicization of relief, and ultimately, appropriateness of intervention.



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| Model | Design | Example | Time and Cost |
|---|---|---|---|
| 1. Rapid assessment post impact | Variable reliance on case study, participatory methods, and key informant interview | Community managed water supply | 1–2 months to a year<br>$25,000 upwards |
| 2. Post-project comparison of beneficiaries and control group | Data collected after project completed; sample surveys and multivariate analysis used to statistically control for differences in the two groups | Micro-credit programs | Time—variable<br>Costs—1/2–1/3 of above |
| 3. Quasi-experimental design with comparisons before and after the project | Interventional and control groups without randomization, studied as above | Housing programs | As per Model 1 |
| 4. Randomized pre and post-intervention evaluation | Intervention and control groups randomized, then studied by questionnaires or other standardized instruments | Water supply and sanitation, housing programs | 1–5 years<br>$50,000–$1,000,000 |

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Table 3—Four models of impact evaluation[21]

Neutrality, while a cornerstone of many agencies' humanitarian response, is cited as a dilemma.[29] Operational constraints may be formidable, and available local solutions may appear to ignore, if not undermine, the core principles of an agency. Withdrawal from the field, particularly in complex emergencies, sometimes is selected as the only feasible option.

Implementing agencies, at their best, provide technical competence linked to human, material, and financial resources in an evidence-based, context-appropriate manner. In the health sector, implementing agencies commonly vest decisional authority in a medical coordinator. The medical coordinator ideally possesses the technical competence to render an informed opinion, the administrative authority to mobilize resources, and the organizational responsibility for outcomes. Scant literature exists on the uses of evidence by these decision-makers. Nonetheless, basic principles of evidence-based decision-making reveal leadership opportunities for these key individuals and the organizations that support them. Selected opportunities are listed below.

*Recommendations for Implementing Agencies*

1. Acknowledge the main objective in humanitarian assistance—doing the most good for the most people to enable a return to marginal self-sufficiency. In disaster relief, this often means saving lives and alleviating human suffering.
2. Compile and share country background data organized to a common international standard.
3. Limit commodity-driven donations for specific humanitarian sectors pending multi-party, evidence-based needs assessments.
4. Insist on development of and adherence to standardized minimum essential data sets in initial rapid assessment.
5. Call for information priorities in assessment reports along with intervention priorities.
6. Resist calls for survey scientists early in a disaster relief operation.
7. Understand the milestones of relief in humanitarian assistance. Define these milestones and insist that sector/cluster leads report on them. Verify that micro-planning exists to achieve these milestones without micro-managing them.
8. Foster the design and development of concise sector/cluster-specific tools for inter-agency coordination. Be aware of common abuses in the visual display of quantitative information.
9. Insist on NGO participation in sector coordination activities.
10. Recognize a sector-specific coordination process that is (not) working.
    a. All major affected jurisdictions are geographically assessed.
    b. All major affected jurisdictions have an identified host country governmental decision-maker on-site (or accessible).
    c. All major affected jurisdictions have host country, sector-specific administrative leads on-site (or accessible) and resourced to resume their work.
    d. All major affected jurisdictions have explicit partnerships between indigenous/international NGOs and local service providers in a given technical sector.
    e. Host country, sector-specific, administrative leads are discharging their routine duties with the production of routine reports.
    f. Host country, sector-specific, administrative leads are producing their routine reports as well as progressively handling the coordination functions of the relief effort.
11. Distinguish between informational meetings and decisional meetings in the coordination process. Minimize the former and maximize the latter.
12. Distinguish between process reporting and outcome reporting. Do not accept process indicators as mea-



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sures of effectiveness, and insist that progress toward minimum standards be quantitatively reported.

13. Begin to define disaster malpractice. Start by recognizing frank departures from accepted practices associated with bad outcomes. Be willing to name and shame repeat offenders.

## Role of Donors

Donor lessons learned in international aid activities have been meticulously recorded for at least a generation. In July 1980, USAID funded the WASH Project as an innovative way to marshal and deploy resources in the water supply and sanitation field. The WASH functioned as a network providing information, technology transfer, technical assistance, and training resources in support of USAID efforts worldwide. It ultimately worked on some 800 activities in 85 countries. At the close of the 13-year project, the WASH produced a comprehensive analysis of its experience.[30] The analysis was remarkable at the time for its explicit discussion of best practices in technical assistance including the discrete roles of different stakeholders—government (central and local), donor agencies, NGOs, local beneficiaries, and the private sector.

The advent of evidence-based decision-making provides new opportunities for these stakeholders to fulfill their unique roles in international aid.

Groups of similar activities are characterized as:

1. Implement recognized, evidence-based solutions to problems of concern to donors.[3] Such solutions could be disease-specific solutions such as those from the Disease Control Priorities Project,[31] or bundled solutions such as minimum service packages.[32]
2. Use evidence-based tools to identify new approaches to problems of concern to donors. Illustrative examples of evidence-based tools in the health sector include:
    a. *Traditional tools*—Screening (diagnosis); prognosis; therapy; cost-effectiveness; harm/etiology; guidelines; and systematic reviews; and
    b. Evolving public health tools that may be increasingly integrated in the future. These include: food security assessment methodologies; nutritional survey methodologies; and mortality survey methodologies.
3. *Study model programs*—what approaches deserve to be replicated?

    The Active Learning Network for Accountability and Performance in Humanitarian Action and Overseas Development Initiative (ODI) have extensive bibliographies of humanitarian program evaluations. These evaluations indicate many of the attributes of model programs. Model programs distinguish themselves not only by success in their inaugural setting, but also by successful outreach or replication into underserved areas.

    Illustrative examples include service delivery systems such as Community Therapeutic Care in the horn of Africa and Child and Family Wellness Shops (CFW Shops) in Kenya; support service institutions, such as the Grameen bank (micro finance) and Fritz Institute (logistics); clinical service institutions, such as Fistula Hospital in Addis Ababa, Ethiopia, the International Centre for Diarrhoeal Disease Research (ICDDR) in Dhaka, Bangladesh, and the Shoklo Malaria Research Unit in Tak Province, Thailand.

    Overall, there are gaps in the institutional memory of disaster-affected countries that deserve donor support. For example, up to 2004, Ethiopia had no nutrition unit within its Ministry of Health. With its recurring food crises, extensive clinical experience, and local university infrastructure, Addis Ababa could become a regional center of excellence for famine studies. Such institutional development would be no different than what the Fistula Hospital became for management of fistulous disease, or what that the ICDDR became for management of diarrheal disease.

    Developing countries have long hosted internationally recognized centers of excellence in specific technical domains. Donors have an absolute leadership opportunity to examine such centers and help enlarge their successes. A joint consultancy involving a business management expert and a public health expert may be able to analyze the successes of these institutions.
4. *Study failed programs*—what approaches deserve never to be repeated? The flip side to the study of model successes is the study of model failures. The evaluation literature of ALNAP and ODI is again instructive. Field agencies may not want to air their failed experiences, but donors can help foster a culture in which problems are openly addressed. In the context of quality assurance, change management, lean systems, and non-punitive performance reviews, candor should be embraced. An agency that identifies an adverse finding, takes corrective action, and improves its performance deserves recognition. At the same time, donors must be slightly impatient with the process. What is at stake is excess mortality. Where a failed model received donor support, a donor must link studies of these failures to improvements in its own practices.
5. Improve standards for evidence of effectiveness in humanitarian science and services.

Overall, different donors may have institutional preferences for the activities they undertake. Nonetheless, basic principles of evidence-based decision making reveal leadership opportunities for donors regardless of the types of activities they choose to fund. Selected opportunities are listed below.

### *Recommendations for Donors*

1. Define levels of evidence expected of grantees necessary to justify project proposals.
2. Detail the "good citizenship" expected of grantees in regard to uses of information and evidence: (1) participate in rapid epidemiological assessments (REA); (2) georeference key locations; (3) coordinate surveys with sector leads; and (4) share REA and survey findings with sector colleagues and host country counterparts.
3. Mandate the reporting of sentinel events—deaths, sexual- and gender-based violence, etc., as safety and security permit. Require explicit justification for selective withholding of such information if deemed



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harmful to data gatherers or program beneficiaries in complex emergencies. In general, link the adequacy of reporting to continued program funding.
4. Stipulate in grants guidelines the hiring of key program staff (e.g., agency sector coordinators) with criterion-referenced qualifications.
5. Employ technically competent field officers who understand sector-specific best practices from extensive international field experience. Deploy them to the field as donor representatives with spending authority to assist the process of sector/cluster coordination. This is not the same as hiring donor representatives with geographic (rather than technical) areas of responsibility whose scope of work is largely administrative focusing on reviewing grants, making political site visits, and writing reports.
6. As part of monitoring and evaluation, undertake site visits of the donor's choosing in conjunction with sector leads in order to ground truth perceptions and practices.
7. Identify priority topics in program evaluation and provide seed money for impact evaluation design.
8. Support operations research particularly in the domain of cost-effectiveness indicators and metrics.
9. Identify, study, and disseminate information on programmatic success stories in the field.
10. Identify, study, and disseminate information on programmatic failures in the field.
11. Encourage the incorporation of evidenced-based theory into existing knowledge on sector-specific best practices in technical assistance.
12. Envision the donor role as just-in-time guarantor of resources for evidence-based decision-making. This specifically includes critical information gaps requiring evidence or expertise.
13. Embrace evidence-based decision-making as an ongoing theme of Good Humanitarian Donorship.

## Conclusions

A pioneer in evidence-based decision-making cautions, "When beliefs conflict with evidence, beliefs tend to win."[33] Experience shows that evidence may not be ascendant in the competition for ideas. Evidence-based decision-making encompasses external evidence, expertise, and beneficiaries' values and circumstances. Different professional disciplines will place a different premium on each of these components. Taken together, evidence-based decision-making still may not ensure good outcomes. An evidence-based consultant may merely help one go wrong with confidence. However, evidence informs the process. Evidence will help humanitarian stakeholders understand the risks, benefits, and consequences of their actions. Evidence is most likely to correctly explain successes and failures. Conceptual clarity precedes action. The leadership opportunities are precisely in catalyzing the process within the humanitarian community.


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