 Assessing Tsunami Related Mortality in Aceh Province

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Introduction

The tsunami resulted in the deaths of over 210,000 people, with more than 20,700 reported missing and nearly 2,300,000 displaced. Over 126,960 were reported dead in Indonesia, with an additional 93,757 missing and 617,159 displaced.¹ The human toll in Indonesia’s Aceh Province was exceptionally high. Fourteen of 21 districts in Aceh and over 1 million people were affected.² The government’s disaster coordinating agency, BAKORNAS, indicates that in Aceh alone, 123,598 bodies have been buried; 113,937 people are missing, and 406,156 are displaced, though the full impact of the tsunami may never be known.¹,³

The problems that the tsunami-affected population faces are multi-faceted and include loss of family members; displacement; loss of assets, livelihoods, and community structures, as well as a variety of other challenges associated with catastrophic loss and widespread devastation. The Johns Hopkins Bloomberg School of Public Health and Mercy Corps conducted surveys in four districts in Aceh to learn about the demographic and health impacts of the tsunami on displaced households and the intentions of these households regarding resettlement and re-establishment of livelihoods. Permission to conduct the survey was received from the Aceh Province Headquarters Office of Foreign Affairs, the Indonesian military, and from community leaders in each IDP location surveyed.

Assessments

Johns Hopkins University Center for Refugee and Disaster Response conducted two assessments in Aceh province in conjunction with Mercy Corps. The first assessment was conducted in early February in Nagan Raya and Aceh Barat districts in the Meulaboh area. The primary objectives of the first assessment were to assess the mortality impact of the tsunami on displaced households; to examine factors influencing displacement; and to understand the intentions of displaced populations. The second survey was conducted in Banda Aceh and the surrounding district of Aceh Besar in March. Survey objectives included assessing tsunami related mortality and injury; prevalence of selected illnesses; and living conditions and unmet needs of displaced populations.

Both assessments used population proportional to size sampling methodologies based on estimates of displaced populations provided by local authorities. In both instances two-stage cluster survey designs were used. In the Meulaboh survey, a 20x20 design was employed and in Banda Aceh, a 20x24 design was used. Final sample sizes were 388 and 480 households for the Meulaboh and Banda Aceh assessments, respectively. Displaced households living in camps, temporary living centers (barracks), and host-communities were included in the survey.

Results

Meulaboh

Of internally displaced households in Aceh Barat and Nagan Raya districts, 61.8% of households reported one or more family members as presumed dead as result of the tsunami, with an overall mortality rate of 13.9% (95 CI: 12.4-15.4%). Risk of death was greatest in the youngest and oldest age groups; among females; and among members of households involved in the fisheries industry. Mortality risk among females was 1.9 times greater than among males (95 CI: 1.5-3.0) with females accounting for 64.7% (95 CI: 55.9-74.6) of individuals presumed dead. Odds of death were 1.6 (95 CI: 1.1-2.2) times greater among members of households whose livelihoods were based in fisheries.

Overall, 36% of IDPs indicated an intention to return to their original community within three months, and IDPs residing in host communities were 2.2 (95 CI: 1.2-2.8) times more likely to state they intended to return to their original villages or another community as compared to those residing in camps. Findings from the Meulaboh survey have been used by Mercy Corps in planning relief and reconstruction programs, in particular the development of returns and livelihoods programs. Results of the assessment have also been submitted for publication so that other organizations working in Aceh will have access to the information.

Banda Aceh

Preliminary mortality findings suggest a similar pattern to that observed in Meulaboh where mortality risk was significantly greater among women and in the oldest and youngest age groups. The mortality rate among individuals in participating households was significantly greater than in Meulaboh with 22.2% (95 CI: 20.8 – 23.6) of pre-tsunami household members presumed dead. Mortality risk remained significantly greater among women, although the differences were less pronounced between the sexes: 51.6% (95 CI: 48.0-55.1) of deaths were among females and females were 1.2 times as likely as males to have perished in the tsunami (95 CI: 1.0-1.4). Risk of death by age paralleled Meulaboh findings with young adults being the most likely to survive.

Results from the Banda Aceh survey are preliminary. Data was collected on tsunami-related injuries, both in the tsunami and during tsunami-cleanup, illness prevalence data, and information on displaced population needs and living conditions; data analysis is currently ongoing. We anticipate that findings will be used to guide Mercy Corps programming and that publications will be forthcoming.

Discussion

The Hopkins-Mercy Corps Assessments

The impact of the Asian tsunami in Aceh Province, in terms of lives lost and physical destruction, may never be fully measured. As Aceh continues the recovery process, attention should focus on displaced survivors, most of whom lost valuable assets and many of whom lost family members. Mercy Corps estimates that 75% of the displaced population is able and willing to return to their original areas of residence; an additional 15% of the population will need relocation (those living close to the shoreline or who have lost their land); and a further 10% of the population that lived in urban areas must wait for extensive rebuilding before it is possible to return. The shape of the tsunami mortality suggests that among the vulnerable displaced populations in need of special attention are children who have lost their mothers and men who have lost their wives, especially those who are fathers of surviving, minor children.

The Hopkins-Mercy Corps assessments have several key limitations. A principal issue faced by any assessment of mortality in the natural disaster context is survivor bias: because the study population are households with at least one surviving adult member, households that had no surviving members were not captured, thus overall mortality is likely underestimated. Data on pre- and post-tsunami village populations is currently being collected and will be used to estimate overall mortality rates. Another key limitation to the assessments conducted is that neither assessment was comprehensive in terms of population or content. Both assessments included mortality and displacement, but other issues such as injury, illness, and displaced population intentions were included in only one of the two surveys. Johns
Hopkins plans to revise the existing survey instruments and study designs to develop a comprehensive assessment that can be implemented in future disasters to provide a rapid overview of disaster impact and assess the needs and health status of affected populations.

Needs and Impact Assessment in the Post-Disaster Context

Generally, needs and impact assessment in the disaster context faces a variety of challenges: logistics and inter-agency coordination can be difficult in the chaotic disaster aftermath; technical capacity and sound assessment methodologies are often not used; and assessment is frequently not considered a priority immediately after the disaster because efforts are focused on meeting population needs. WHO plays an important role in disaster assessments, both in terms of coordination and technical expertise. In future disaster situations, it is crucial that assessments are conducted in a timely manner and that they provide information that is both detailed enough to understand variations between population sub-groups, but also representative of disaster impact and needs in the entire affected population. Technical capacity and sound methodologies are essential for findings to provide a true picture of population status. Another important issue is sharing of information; many NGOs conduct assessments at the same time as international organizations and governments and it is important that findings are shared in a timely manner; in recent years, the Humanitarian Information Center (HIC) has played a key role in facilitating information exchange however, improved coordination of assessments and dissemination of findings would benefit both disaster victims and responding organizations.

Conclusions

In Aceh province, the oldest and youngest population sub-groups faced had an increased risk of mortality in the tsunami, presumably because they lacked the physical strength to endure the trauma; it is not unexpected that the younger adult population had the greatest survival rate because are expected to have the greatest physical strength. Females faced a significantly greater mortality risk than males; this is likely a result of a combination of factors including physical strength, but also physical location at the time of the tsunami. Among the vulnerable populations that were displaced by the tsunami, children who have lost their mothers and men who have lost their wives, especially those who are fathers of surviving, minor children, are in need of special attention.

The surveys conducted by Johns Hopkins and Mercy Corps demonstrate that it is possible to conduct effective mortality and needs assessments in post-disaster context. Survey results were used to inform guide Mercy Corps programming and resulted in an informed response. Responses to future disasters could be improved if large scale impact and needs assessments were conducted immediately following the disaster and if results were widely disseminated among the relief community.