Section 9: Mitigation

Stakeholders respond to health impacts with mitigation strategies. These can be measures that avoid, minimize, or eliminate an adverse effect, or measures that maximize a potential benefit. Although mitigation is presented as the final phase in an HIA, it should be viewed as an ongoing process, beginning as the project is being conceptualized and designed, and ending only when impacts from the project and decommission have concluded. Mitigations may be:

- Regulatory requirements
- Negotiated commitments made by project proponents
- Voluntary contributions made to maximize potential benefits

The project can use the outcomes of the risk assessment step (Section 8) to establish actions that will limit the severity of identified impacts. In general, mitigation measures should be tied to potential project impacts; however, voluntary contributions that are made to maximize potential benefits are important and significantly improve a project’s profile in affected communities. Similarly, project proponents may wish to formally negotiate a series of specific commitments to affected communities (e.g., participatory monitoring of certain impacts, subsistence resource access, quantity and quality). The presentation of health mitigation measures should be carefully coordinated with the environmental and social assessment, as overlap is likely. However, in some circumstances, if the project is large or complex, a separate chapter (or report) on how to mitigate health impacts may be appropriate.

Some important considerations for mitigation strategies include:

- Determining the level of prevention where the mitigation will occur (e.g. primary, secondary, or tertiary prevention)
- Availability of mitigation strategies (e.g. engineering interventions that affect water quantity, quality, and sanitation)
- Timeline for the mitigation effort
- Availability of interim mitigations
- Local capacity to absorb the proposed mitigation strategies
- Responsibility for implementation

Fundamental Concepts

Mitigations are generally organized around two fundamental public health concepts: disease prevention and health promotion and education.

Disease Prevention

Disease prevention includes any intervention that seeks to reduce or eliminate diagnosable conditions. It may be applied at the individual level (as in immunization) or at the community level (as in chlorination of the water supply).
The concept of disease prevention is often illustrated by the prevention pyramid, which is composed of the following actions:

*Primary Prevention* – Prevents the condition before it occurs (e.g., preventing diabetes before it develops). For HIA, these actions include elimination (eliminate certain features of the project), substitution (for example, providing diesel fuel as a fuel source instead of wood), design or engineering preventions, and administrative controls.

*Secondary Prevention* – Once a health condition exists, secondary prevention seeks to screen individuals at high risk and to stop the onset of symptoms in those who have the condition (e.g., early diagnosis of diabetes and accurate management to prevent vascular symptoms). Secondary prevention measures are appropriate when the project has a high likelihood of causing an effect or it has had some observable effect. Secondary prevention efforts seek to detect that effect as early as possible and keep it from bringing harm to health (e.g., detecting elevations in contaminant levels and keeping individuals away from certain project sites or discouraging over-consumption of certain foods).

*Tertiary Prevention* – Once health conditions exist and once individuals have symptoms, tertiary prevention seeks to avoid symptom progression. This usually involves treatment or rehabilitation of existing, serious problems, such as preventing infection of diabetic foot ulcers. Tertiary prevention is appropriate when the project has had some effect and this effect has caused health impacts. Tertiary preventions seek to keep the human health impacts from continually affecting communities or from affecting a wider circle of people.

**Figure 4: The Disease Prevention Pyramid**

![Disease Prevention Pyramid Diagram](image)
Even though well-developed generic health intervention strategies have been developed for many problems (e.g., infectious diseases), the HIA team should develop mitigation strategies that are scientifically defensible (evidence-based) and tailored to the local situation.

The HIA team must distinguish between regulatory mitigations enforced by law (e.g., contaminants of concern, hazardous materials transport) and negotiated or voluntary mitigations with the applicants. For regulatory mitigation, the impact must be under the control of the proponent and clearly tied to a project-related effect. For negotiated mitigation or voluntary mitigation, the proponent usually has less control over the health impact but voluntarily agrees to adjust their project plan or institute a new program to alleviate a health impact. These mitigations are generally discussed when the impact is indirect or not causally linked with a specific project feature. Many proponents have internal corporate policies that prioritize attentiveness to negotiated or voluntary mitigations. In addition to identifying adverse impacts, the HIA team should help proponents find ways to improve the regions they develop. Mitigation selection is not a pure process based only on data. Much mitigation exists at the interface between analysis, risk perception, and community need. Project proponents and the HIA team must engage key stakeholders, including relevant tribal authorities, during the selection of mitigation measures.

The HIA team must also remember that significant adverse community reaction can develop when the conditions for negotiated mitigations or voluntary mitigation efforts are not clarified and explained (i.e., the project may not agree to everything that may be desired by local communities). The HIA may reveal opportunities that are not engaged by proponents, but this should not preclude interventions by tribal organizations or other NGOs.

**Health Promotion and Education**

Another approach to mitigation is health promotion and education. It includes any combination of health education and related interventions—organizational, political, economic—designed to facilitate improved health through behavioral and environmental adaptations. In combination with primary prevention, health promotion and education is the most efficient and cost-effective method of managing potential impacts.

A workforce health promotion and education effort spearheaded by the project can significantly impact behaviors and practices in local communities by using the project workforce as peer educators and ambassadors to local communities. There is substantial evidence in the prevention literature showing that peer educators are one of the most successful change agents at the household level.

**Critical Aspects of Mitigation Plans**

Evaluation of the mitigation strategy requires careful review of several critical elements, including resource flows and responsibilities, local absorptive capacity, and social and environmental determinants.
Resource Flows and Responsibilities
The effectiveness of the mitigation strategy depends on adequate resource flows and careful delegation of responsibility between stakeholders. Among the most challenging tasks is assessing local mitigation resources and identifying reliable partners that can sustain mitigation efforts. Local participation in mitigation requires preparation, experience, and sufficient personnel and financial resources.

In one example from international HIA work, proponents will often build and/or refurbish hospitals, clinics, or health dispensaries as mitigation. Although these activities are highly visible and initially well-received, they tend are difficult to sustain long-term due to shortage of technical support staff such as physicians, nurses, laboratory technicians. To be sustainable, structural improvements should be coupled with a realistic and long-term assessment of the locally available human resources.

Experience also shows that mitigation measures have a greater sustainability when they are focused on specific project effects, such as adequate drinking-water supply, solid and human waste disposal, and appropriate systems to deal with the influx of workers in a community.

Social Determinants Issues
A variety of important potential positive and negative indirect effects tied to social determinants of health and psychosocial issues (e.g., alcohol, drug use, gender violence, suicide) may be identified. Mitigation strategies directed towards social determinants must:

- Coordinate with social impact mitigation strategies
- Be carefully reviewed, and the roles and responsibilities realistically appraised
- Account for the existence of personal choice
- Be clearly defined to include factors that are within the span of control of the project (e.g. workforce scheduling, imposition of a “dry status” at all project facilities, pre-employment and random drug and alcohol testing)

At a minimum, strategies directed towards social determinants will require a multidisciplinary effort, involving social and medical specialists as well as community stakeholders. Appendix 1 presents a more detailed list of potential mitigation actions by health effects category.