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Original Contribution

Integrating Human Health and Environmental Health into the DPSIR Framework: A Tool to Identify Research Opportunities for Sustainable and Healthy Communities

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Abstract: The U.S. Environmental Protection Agency has recently realigned its research enterprise around the concept of sustainability. Scientists from across multiple disciplines have a role to play in contributing the information, methods, and tools needed to more fully understand the long-term impacts of decisions on the social and economic sustainability of communities. Success will depend on a shift in thinking to integrate, organize, and prioritize research within a systems context. We used the Driving forces–Pressures–State–Impact–Response (DPSIR) framework as a basis for integrating social, cultural, and economic aspects of environmental and human health into a single framework. To make the framework broadly applicable to sustainability research planning, we provide a hierarchical system of DPSIR keywords and guidelines for use as a communication tool. The applicability of the integrated framework was first tested on a public health issue (asthma disparities) for purposes of discussion. We then applied the framework at a science planning meeting to identify opportunities for sustainable and healthy communities research. We conclude that an integrated systems framework has many potential roles in science planning, including identifying key issues, visualizing interactions within the system, identifying research gaps, organizing information, developing computational models, and identifying indicators.

Keywords: asthma disparities, causal framework, DPSIR, environmental health, public health, sustainability

INTRODUCTION

The sustainable well-being of communities is inextricably linked to both the health of the earth's ecosystems and the health of humans living in the community. Ecosystems provide goods and services to humans, including provisioning of food, fuel, and fresh air and water, regulation of climate and flooding, and cultural value through recreational and esthetic opportunities (MEA 2005). In turn, the condition of the environment is an influential determinant of human health (Briggs 2008). However, both ecosystem health and human health can be overlooked by individuals, businesses, or regulatory agencies when making economic

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