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Ecological models and multilevel interventions

Peter Winch

Health Behavior Change at the Individual, Household and Community Levels

224.689
Ecological (multi-level) models

- We have been talking about different levels in this course, but mostly about one level at a time
- A number of authors have developed elaborate models that specify all of the different levels that affect behavior, all in one model
Ecological (multi-level) models

- Differences between these formal ecological models and the ‘individual-household-community’ model we have been using so far in the course:
  - More and different levels specified
  - Emphasis on effect of rules, regulations and guidelines implemented at different levels
SEM of McLeroy et al. 1988
The Social Ecological Model (SEM) of McLeroy et al. 1988

- Two key concepts
  - **Multiple levels**: Behavior affects and is affected by multiple levels of influence
  - **Reciprocal causation**: Individual behaviors shape, and is shaped by, the social environment
    - Similar idea in Social Cognitive Theory
Reciprocal causation example

Individual behavior

Social norms  ➔  Rules, regulations, guidelines

Social norms  ←  Rules, regulations, guidelines
Reciprocal causation example: Seat belt use

Seat belt use by individuals

Social norms about seat belt use

Laws/fines about seat belt use
Five levels in The SEM of McLeroy 1988

1. Intrapersonal
2. Interpersonal
3. Organizational
4. Community
5. Public policy

- What levels aren’t here?
<table>
<thead>
<tr>
<th>Level of influence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal</strong></td>
<td>Individual characteristics that influence behavior: Knowledge, skills, self-efficacy</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>Interpersonal processes and groups providing identity and support</td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td>Rules, regulation, policies, structures constraining or promoting behaviors</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Community norms (community regulations)</td>
</tr>
<tr>
<td><strong>Public policy</strong></td>
<td>Policies and laws that regulate or support healthy practices/behaviors</td>
</tr>
</tbody>
</table>
SEM: McLeroy 1988

- The levels Interpersonal, Organizational, and Community have slightly different meanings, depending on the author
  - Variation in what fits in Organizational and what fits in Community
- Not clear where culture, social class, racism, gender, economics/employment are supposed to fit, or if they fit anywhere
Applying The SEM of McLeroy to different behaviors
# SEM application: Eat healthy foods in Baltimore

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal</strong></td>
<td>Knowledge about different foods, skills in cooking, self-efficacy to make changes in diet</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>Patterns of food preparation in household, food habits of peers</td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td>Food availability and prices in local stores &amp; restaurants, foods served at church dinners, actions by community groups to improve local availability of healthy foods</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Community norms regarding diet</td>
</tr>
<tr>
<td><strong>Public policy</strong></td>
<td>Regulations on fat and sodium content and labeling of foods, food stamps, subsidies to agri-business</td>
</tr>
</tbody>
</table>
## SEM application: Adolescent smoking

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal</strong></td>
<td>Knowledge about smoking and health, perceived risk of smoking-related disease, self-efficacy to refuse cigs.</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>Smoking patterns/support in household and among friends and peers</td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td>Cigarette availability and prices in local stores, actions by community groups, insurance policies/prices for smokers, marketing of cigarettes by companies</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Community norms regarding smoking</td>
</tr>
<tr>
<td><strong>Public policy</strong></td>
<td>Regulations on smoking in schools, offices, restaurants; taxes and warning labels on tobacco products</td>
</tr>
<tr>
<td>Level of influence</td>
<td>Concepts from this course</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Intrapersonal</strong></td>
<td>Individual behavior change models, empirical efficacy, risk perception, stages of change</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>Household roles/structures, self-construal, kinship systems, public/private domain, peer education, intimate partner violence</td>
</tr>
<tr>
<td><strong>Organizational</strong></td>
<td>Social capital (organizations)</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Social networks, social norms, social capital (networks), other factors (???)</td>
</tr>
<tr>
<td><strong>Public policy</strong></td>
<td>Local, state, federal</td>
</tr>
</tbody>
</table>
References on The SEM of McLeroy et al. 1988

  - Note that “An ecological perspective on” means “A multi-level model for”

Other ecological models
Ecological models: Terminology

- **Ecological models**
  - Term used by many disciplines, refers to a wide range of unrelated models
  - Only rarely related to the science of ecology
  - “Ecological” means multi-level

- **Social ecological model**
  - More specific, found in fewer areas of study e.g. systems theory, health education

- **THE social ecological model (SEM)**
  - Several models lay claim to be the definitive SEM, **THE** SEM rather than a SEM
Two versions of **The SEM**

- **The SEM of Urie Bronfenbrenner**
  - Used in ecological systems theory
  - Four interlocking spheres of influence:
    - Microsystems, mesosystems, exosystems, macrosystems

- **The SEM of McLeroy, Stokols and others**
  - Used in health education/behavior change
  - Five levels of influence on behavior:
    - Intrapersonal, interpersonal, organizational, community, public policy
Interpersonal level in ecological models

- Interpersonal level in The SEM of McLeroy is crowded
  - Household roles/structures, self-construal, kinship systems, public/private domain, peer education, intimate partner violence
- I like to see household have its own level separate from friends/neighbors/peers, especially in low-income countries
Interpersonal level: Approach of Blum et al. 2002

- Example of model where interpersonal level is broken out in more detail on next page

- **Interpersonal level** is divided by Blum et al.:
  - Family
  - Peers
  - School

- **Organizational level** represented by:
  - School
Ecological model of adolescent behavior (Blum, McNeely, & Nonnemake, 2002)

Macrolevel environment

Social Environment
Risk Protection

School
Risk Protection

Family
Risk Protection

Peers
Risk Protection

Individual
Risk Protection

Health risk behaviors in adolescence
• Substance use
• Diet/exercise
• Injury/violence
• Sexual/reproductive

Youth health outcomes
• Physical health
• Emotional health
• Social health
Ecological models of health behavior: Search terms

- Best search term in PubMed is
  - Social ecological model

- Don’t search on these terms, will get too much irrelevant information:
  - Ecological model
  - Multi-level model
Ecological (Multi-level) models for HIV/AIDS
Ecological (Multi-level) models for HIV/AIDS

- The SEM of McLeroy has been less popular for HIV/AIDS
- No obvious place in SEM for factors related to human rights, gender, economics/employment, politics
- A number of models have been proposed that have some similarities to McLeroy’s SEM, but have more levels, different names for levels, and make human rights, gender etc. more explicit

- Reference:

- Draws more on sociological terms & concepts
Ecological model of Sweat and Denison

- **Super-structural** – Social Justice, Class, Race, Gender, Equity
- **Structural** – Laws and Policies
- **Environmental** – Physical or Social Changes in Environment
- **Relational/Dyadic** – Family & Couple
- **Individual** – Psychological
- **Technological** – Antiretroviral drugs, vaccines

There are two types of nested levels:

- **Nested levels**
- **Stand-alone level**
Sweat and Denison: Unclear where to fit household and community

- Household and community levels are buried in the model
  - Household might fall under dyadic/relational
  - Community might fall in environmental and/or dyadic/relational
### Superstructural level (Absent from SEM)

<table>
<thead>
<tr>
<th>Definition</th>
<th>Examples</th>
<th>Change mechanism</th>
</tr>
</thead>
</table>
| Macrosocial and political arrangements, resources and power differences that result in unequal advantages | • Economic under-development  
• Declining agricultural economy  
• Poverty  
• Sexism, racism  
• Homophobia  
• Western domination, imperialism | • National and international social movements  
• Revolution  
• Land redistribution  
• War  
• Empowerment of disenfranchised populations |

Vicente Navarro often stresses importance of this level
## Structural level (Public Policy in SEM)

<table>
<thead>
<tr>
<th>Definition</th>
<th>Examples</th>
<th>Change mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laws, policies and standard</td>
<td>• Unregulated commercial sex</td>
<td>• Legislative lobbying</td>
</tr>
<tr>
<td>operating procedures</td>
<td>• Bachelor wage system</td>
<td>• Civil &amp; human rights activism</td>
</tr>
<tr>
<td></td>
<td>• No family housing required at worksites</td>
<td>• Boycotts</td>
</tr>
<tr>
<td></td>
<td>• Lack of human rights laws</td>
<td>• Constitutional &amp; legal reform</td>
</tr>
<tr>
<td></td>
<td>• No financial support for social services</td>
<td>• Voting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Political pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Donor policies</td>
</tr>
</tbody>
</table>
# Environmental level

<table>
<thead>
<tr>
<th>Definition</th>
<th>Examples</th>
<th>Change mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual living conditions, resources &amp; opportunities</td>
<td>- Work camps with single men &amp; few women, few condoms, high prevalence of HIV &amp; STIs, family far away</td>
<td>- Community organization, increase social capital e.g. Sonagachi project</td>
</tr>
<tr>
<td>Recognition of individual, structural &amp; superstructural factors</td>
<td>- Few job opportunities, few social services, industrialization, urbanization</td>
<td>- Provision of social services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Legal action</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Unionization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enforcement of laws</td>
</tr>
</tbody>
</table>
Environmental level

- Partially corresponds to Organizational and Community levels in McLeroy’s SEM
- Typically refers to the social environment, rather than to the physical environment
- For applications to other behaviors e.g. exercise, sometimes refers more to the physical environment
Example where environmental level refers to the physical environment

- Reference:
Example where environmental level refers to the physical environment

<table>
<thead>
<tr>
<th><strong>Personal</strong></th>
<th>Gender, age, marital status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wealth/economic status</td>
</tr>
<tr>
<td></td>
<td>Body mass index, other health problems</td>
</tr>
<tr>
<td><strong>Psycho-social</strong></td>
<td>Intention to exercise, perceived consequences of</td>
</tr>
<tr>
<td></td>
<td>exercising, perceived behavioral control, self-</td>
</tr>
<tr>
<td></td>
<td>efficacy, subjective norms</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Presence of sidewalks, heavy traffic, hills,</td>
</tr>
<tr>
<td></td>
<td>streetlights, unattended dogs, enjoyable</td>
</tr>
<tr>
<td></td>
<td>scenery, frequent observation of others</td>
</tr>
<tr>
<td></td>
<td>exercising, high crime levels</td>
</tr>
</tbody>
</table>
Application of Sweat/Denison model to lead poisoning in Ecuador
Lead poisoning in Ecuador: The situation (Karen Kirk)

- Rural village in Andes of Ecuador
- High rate of mental and physical disabilities in children due to lead poisoning
Lead poisoning in Ecuador: The situation

- Cause is lead from production of terra cotta roof tiles, made on small family plots (Household-level production)
- Tiles dipped in lead-based glaze
Photo by Karen Kirk.
Lead poisoning in Ecuador: The situation

- Soil and water heavily contaminated with lead, resulting in ingestion through food and water
Lead poisoning in Ecuador: Applying Health Belief Model

- **Perceived severity**: High
- **Perceived susceptibility**: High
- **Perceived benefits** of alternative glaze: High
- **Perceived barriers** to using alternative glaze: High, mostly economic, alternative is more expensive, would cut into their meager profits
- **Self-efficacy**: Hard to assess, don’t currently have access to the alternative glaze
- **Cues to action**: Not applicable

**Question**: Does this help us identify an intervention/design an intervention?
## Applying Sweat-Denison model to lead poisoning in Andes of Ecuador

<table>
<thead>
<tr>
<th>Levels</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superstructural</td>
<td>Limited power and representation of rural villages; lack of economic development; inequalities related to class and race</td>
</tr>
<tr>
<td>Structural</td>
<td>Lack of regulation of lead-based glazes; insufficient subsidy for lead-free glazes</td>
</tr>
<tr>
<td>Environmental</td>
<td>Existing contamination of soil and water; lack of other economic opportunities</td>
</tr>
<tr>
<td>Relational/Dyadic</td>
<td>Organization of production of tiles at household level; household decision-making</td>
</tr>
<tr>
<td>Individual</td>
<td>HBM constructs: Perceived susceptibility, severity, benefits, barriers, skills, self-efficacy</td>
</tr>
<tr>
<td>Technological</td>
<td>Alternative lead-free glazes</td>
</tr>
</tbody>
</table>
Interventions at each level in the Sweat/Denison model
Interventions at each level of change for HIV/AIDS prevention  
*(Sweat & Denison, 1995; Coates & Collins, 1997)*

<table>
<thead>
<tr>
<th>Levels</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superstructural</td>
<td>Change in class, race, gender relations</td>
</tr>
<tr>
<td>Structural</td>
<td>Enact policies and laws</td>
</tr>
<tr>
<td>Environmental</td>
<td>Improve access to condoms, foster group solidarity &amp; social norms</td>
</tr>
<tr>
<td>Relational/Dyadic</td>
<td>Partner communication, emotion &amp; expectations</td>
</tr>
<tr>
<td>Individual</td>
<td>Increase HIV-related knowledge; change risk perceptions</td>
</tr>
<tr>
<td>Technological</td>
<td>HIV and STI treatments, HIV vaccines</td>
</tr>
</tbody>
</table>
Thai 100% Condom Program

- Reference:
Thai 100% Condom Program

- Began in 1991 in commercial sex work establishments
- Components
  - Policy mandate/enforcement: Condom use mandatory in all sex acts in commercial sex work establishments
  - Access to condoms mandatory
  - STI testing and management, brothel owners fined if STIs occur
  - Media campaign
Thai 100% Condom Program

- Results:
  - Condom use: 14-94% from 1989-1993
  - Prevalence of five most common STIs down 79% (Hanenberg, et. al., 1994)
- Greatly increased interest in environmental/structural interventions
Structural & Environmental Interventions Case Study: Dominican Republic
Structural & Environmental Interventions
Case Study: Dominican Republic

- Aimed to:
  - Replicate success of Thai 100% condom program in reducing HIV transmission in commercial sex establishments
  - Demonstrate the added benefit of the structural & environmental intervention components over the individual-level components alone
Interviews during Formative Research

**Interview One**
- Personal history and trajectory into sex industry
- HIV/AIDS knowledge and attitudes
- Free lists on condom promotion and partner types

**Interview Two**
- Sex establishment environment
- Sexual negotiation and behavior
- Advantages/disadvantages and facilitators/barriers to a hypothetical 100% condom use policy

**Interview Three**
- Variations in sexual behavior/condom use per partner type
- Pile sorts, rankings, and problem-solving
### Facilitators and barriers identified in formative research

<table>
<thead>
<tr>
<th>Level</th>
<th>Facilitators</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Knowledge and self-efficacy</td>
<td>Risk perceptions</td>
</tr>
<tr>
<td>Relational</td>
<td>Communication/negotiation</td>
<td>Trust, relationship intimacy</td>
</tr>
<tr>
<td>Environmental</td>
<td>Solidarity and support mechanisms</td>
<td>Condom supply, lack of cues, alcohol use</td>
</tr>
<tr>
<td>Structural</td>
<td>Examples of rules/regulations</td>
<td>Lack of government will; corruption</td>
</tr>
<tr>
<td>Superstructural</td>
<td>Work of MODEMU/COIN</td>
<td>Gender roles</td>
</tr>
<tr>
<td>Technological</td>
<td>Clinical staff’s competence/will</td>
<td>Lack of resources; lack of medications</td>
</tr>
</tbody>
</table>
Intervention was directed toward four different groups of people

- Intervention developed to promote 100% condom use in commercial sex establishments, directed toward:
  - Commercial sex workers
  - Clients of commercial sex workers
  - Owners of establishments
  - Local government and police
- 5 intervention components
5 Intervention Components

(1) Building Solidarity and Collective Commitment among sex workers (Building Social Capital)
- Participatory workshops
- Discussions on roles & responsibilities
- Focus on issues of low risk perception for regular paying clients

(2) Facilitating environmental cues to action
- Posters, stickers and bowls filled with condoms in visible locations in sex establishments
- Ensuring condom supply
- Disc jockey sharing HIV prevention messages
- Information booths and participatory theater with male clients

(3) Ensuring quality clinical services
- Enhance government STD services
- Use of Peer CSW counselors at STD clinic
5 Intervention Components

(4) Establishing a regional, governmental 100% condom policy

- Regional government policy requiring condom use in Puerto Plata
- Owners were told that they, not sex workers, were responsible for complying with 100% condom policy and intervention

(5) Monitoring and encouraging intervention compliance

- Monthly environmental assessments
- Feedback loop to improve intervention in both cities; notifications, intensified education; award certificates
- Graduated sanction system in Puerto Plata
Creating a multi-level model for water and sanitation projects in Bangladesh
Creating a multi-level model for water and sanitation projects in Bangladesh

- We have been working with ICDDR,B (Steve Luby) and group on developing and implementing behavior change interventions in two large randomized trials of packages of water and sanitation interventions in Bangladesh
- Early on we identified the need to develop a comprehensive framework of determinants to guide intervention development
Creating a multi-level model for water and sanitation projects in Bangladesh

- We thought it would be easy, but we were wrong
- There are many models and frameworks out there, but each is partial
- Many are focused on one specific behavior or set of behaviors, none provided sufficient guidance for a comprehensive intervention
Example of existing framework: FOAM

- Developing by Water and Sanitation Program of the World Bank
- Specific for handwashing promotion
FOAM - Focus, Opportunity, Ability, Motivation

A draft behavior change framework
HW programs

March 2009
<table>
<thead>
<tr>
<th>Focus</th>
<th>Opportunity</th>
<th>Ability</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target population</td>
<td>Access/availability</td>
<td>Knowledge</td>
<td>Attitudes and beliefs</td>
</tr>
<tr>
<td>Desired behavior</td>
<td>Product attributes</td>
<td>Social support</td>
<td>Expectations</td>
</tr>
<tr>
<td></td>
<td>Social norms</td>
<td></td>
<td>Threat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intention</td>
</tr>
</tbody>
</table>
Factors missing in other models

- Characteristics of the water and sanitation hardware being promoted (handwashing station, water treatment technology, latrine etc.), and the cost and complexity of using it;
- Characteristics of the physical environment: Chemical and microbiological composition of different available sources of water, level of the water table, pattern of precipitation, population density; and
- Factors affecting habit formation, whether a behavior becomes habitual, process of habit formation
Supportive Environment

**LEVELS**
- Household
- Compound
- Community

**DIMENSIONS**
- Physical Environment
- Economic resources
- Social Norms
- Leadership & advocacy

**Features of behaviors:**
- Ease, convenience, perceived efficacy

**Individual**
- Knowledge & skills
- Subjective norms
- Self-efficacy

**Features of products/hardware**
- Availability
- Effectiveness
- Complexity/Ease
- Convenience
- Maintenance

**Formation of new habits**
- CUES TO ACTION
- REPETITION
- STABLE ENVIRONMENT TO PRACTICE BEHAVIOR

**Threat perception**
- Disgust
- Social Support

**NEW BEHAVIORS BECOME HABITUAL**

First version
Reaction to the first version

**Strengths**
- People see their favorite constructs are mentioned
- Hardware, habits and other factors not in previous models were included in this model

**Weaknesses**
- People liked it, but then didn’t use it
- Too complex and hard to use
- Some constructs can go in several places
- Multi-level idea not well communicated
Changes in revised version: IFHPS

- Less emphasis on individual-level psychological factors
- Environmental and sociodemographic factors explicitly part of framework
- Specific products and behaviors that are being promoted are further integrated into the main framework
IFHPS
Integrated Framework for Hygiene, Point of use water treatment, and Sanitation
Levels
- Societal / Structural
- Community
- Interpersonal / Household
- Individual
- Behavioral / Habit formation

Three columns or dimensions
- Environmental & socio-demographic
- Psychosocial “Software”
- Product / Technology “Hardware”

Is a row / level rather than a column in the Sweat / Denison model.
Columns/dimensions in IFHPS

1. Environmental/sociodemographic
   - Not amenable to change

2. Psychosocial/‘Software’
   - Amenable to change by interventions

3. Product/technology/‘Hardware’
   - Innovative to think about it at multiple levels
   - Corresponds to Technological level in Sweat/Denison model
Five rows or levels
This has been controversial for some, the idea that behavior itself is a level, and that it is below/within the individual.
## Rows/levels in IFHPS: Links to other multi-level models

<table>
<thead>
<tr>
<th>IFHPS</th>
<th>Sweat/Denison</th>
<th>McLeroy et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Societal/Structural</td>
<td>Structural</td>
<td>Public Policy</td>
</tr>
<tr>
<td>2. Community</td>
<td>Environmental (Social environment)</td>
<td>Community Organizational</td>
</tr>
<tr>
<td>3. Interpersonal/household</td>
<td>Relational/Dyadic</td>
<td>Interpersonal</td>
</tr>
<tr>
<td>4. Individual</td>
<td>Individual</td>
<td>Intrapersonal</td>
</tr>
<tr>
<td>5. Behavioral/Habit formation</td>
<td>Not present</td>
<td>Not present</td>
</tr>
</tbody>
</table>
Levels

- Societal / Structural
- Community
- Interpersonal / Household
- Individual
- Behavioral / Habit formation

Environmental & socio-demographic

Psychosocial “Software”

Product / Technology “Hardware”
Levels

- Societal / Structural
- Community
- Interpersonal/ Household
- Individual
- Behavioral/ Habit formation

Environmental & socio-demographic

- Policy and regulations, climate and geography
- Access to markets, access to resources, built and physical environment
- Roles and responsibilities, household structure, division of labor
- Wealth, age, education, gender, livelihoods/ employment
- Favorable environment for habit formation, opportunity for repetition of behavior
Women garments workers of research site coming to home in afternoon for lunch break

Levels

Societal / Structural
Community
Interpersonal/ Household
Individual
Behavioral/ Habit formation

Psychosocial “Software”

Leadership / advocacy, cultural identity
Shared values, collective efficacy, social integration, stigma
Injunctive norms, descriptive norms, aspirations, shame
Self efficacy, knowledge, disgust, perceived threat
Existing water and sanitation habits, outcome expectations
Levels

- **Societal / Structural**
- **Community**
- **Interpersonal/ Household**
- **Individual**
- **Behavioral/ Habit formation**

Product/ Technology

“Hardware”

- Manufacturing, financing and distribution of the product, current and past national policies and promotion of products
- Location, access, availability, individual vs. collective ownership/access and maintenance of the product
- Sharing of access to product, modeling/demonstration of use of product
- Perceived cost, value, convenience and other strengths and weaknesses of the product
- Ease / Effectiveness of routine use of product
Need to be changed only new drum pic.

Chlorine dispenser

Double chamber water filter

Aqua tab

20 liter plastic drum with attached tap

10 liter aluminum kolshi and lid

সাবান দিয়ে দুঃহাত ধুলে
সুস্থ থাকব সবাই মিলে

প্রকাশনায়: আইসিডিডিআর,বি, মহাখালী, ঢাকা

### IFHPS: Application to handwashing with soap using handwashing station

<table>
<thead>
<tr>
<th>Levels</th>
<th>Environmental &amp; socio-demographic</th>
<th>Psychosocial</th>
<th>Hand-washing station (HWS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Societal / Structural</td>
<td>Policy and regulations, climate and geography</td>
<td>Leadership / advocacy, cultural identity</td>
<td>Manufacturing, financing and distribution of the HWS</td>
</tr>
<tr>
<td>Community</td>
<td>Access to markets, access to resources, built and physical environment</td>
<td>Shared values, collective efficacy, social integration, stigma</td>
<td>Location of HWS, individual vs. collective ownership/access to the HWS, maintenance of water and soap in HWS</td>
</tr>
<tr>
<td>Interpersonal/ Household</td>
<td>Roles and responsibilities, household structure, division of labor</td>
<td>Injunctive norms, descriptive norms, aspirations, shame</td>
<td>Sharing of access to HWS, modeling/demonstration of use of HWS by family members and neighbors</td>
</tr>
<tr>
<td>Individual</td>
<td>Wealth, age, education, gender, livelihoods/ employment</td>
<td>Self efficacy for handwashing, knowledge, disgust related to unclean hands, perceived threat of unclean hands</td>
<td>Perceived cost, value, convenience and other strengths and weaknesses of HWS</td>
</tr>
<tr>
<td>Behavioral/ Habit formation</td>
<td>HWS located in a place that facilitates habitual handwashing with soap</td>
<td>Existing handwashing habits, outcome expectations for handwashing</td>
<td>Ease/Effectiveness of using HWS for handwashing</td>
</tr>
</tbody>
</table>