Process Models and PRECEDE

William R. Brieger, MPH, CHES, DrPh
Johns Hopkins University
Section A

Process Models
Process Models

- Field theory—unfreezing behavior
- Stages of change
  - Transtheoretical model
- Adoption of innovations
The Next Step in Force Field Analysis

- Field theory
- Steps toward reaching the goal in force field analysis
- Need to “unfreeze” the old behavior
- Eventually “refreeze” as a new habit
Unfreezing
- A conscious recognition that an existing behavior may no longer be functional or that a new behavior is needed

Evaluation
- An effort to understand and consider the implications of the change
Goal setting

- A decision on trying to change the nature of the behavior involved and the circumstances under which the behavior will be performed
Process Models

Field Theory

 Trial/action

- An effort is made to enact the new behavior/refrain from the old behavior and at the same time, the person is taking cognizance of the problems and benefits encountered
Process Models

Field Theory

Re-freezing

- The new learning has become a habit or so much a routine part of an individual’s on-going behavior as to be taken for granted, self-sustaining
Transtheoretical Model
Stages of Change

- **Precontemplation**: No intention to adopt behaviour in foreseeable future
- **Contemplation**: Not currently, but thinking about it, may intend
- **Preparation**: Seeking information, acquiring resources and skills needed to carry out the behaviour
Transtheoretical Model
Stages of Change

- **Action**: Carrying out the behavior for some time
- **Maintenance**: Have taken the action for a considerable period of time
# Stages for Bed Net Use

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-contemplation</td>
<td>Not thinking about buying a net</td>
</tr>
<tr>
<td>Contemplation</td>
<td>Considering insect nuisance, seeking information and advice about where to buy</td>
</tr>
<tr>
<td>Preparation</td>
<td>Getting money together; plan when will visit shop; actually purchases</td>
</tr>
<tr>
<td>Action</td>
<td>Sleeps under net nightly for some weeks</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Has slept under net for whole rainy season</td>
</tr>
<tr>
<td>Relapse</td>
<td>Feels hot in dry season, stops sleeping under net</td>
</tr>
<tr>
<td>Stage</td>
<td>Driving</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Pre-contemplation | + Public awareness campaign  
                     + Law enforcement stepped up | – No history of accidents  
                            – Belief that accidents are due to fate |
| Contemplation  | + Desire to learn consequences  
                     + Learn how to protect oneself | – Difficulty in obtaining highway code  
                               – Health worker not free to talk |
| Action        | + Parents encourage protection  
                     + Wife encourages protection | – Friends say it’s all a matter of fate  
                               – Helmet only available in large city  
                               – Helmet expensive |
| Maintenance    | + Praise from relatives  
                     + Praise from passengers | – Helmet hot in the tropics  
                               – Strap irritates neck  
                               – Police will ignore if bribed |
Stages of Change Can Be Measured

FIGURE 1. Stages of consistent condom use with primary and other sex partner(s) among sexually transmitted disease clinic patients – Project RESPECT pilot study, 1993

Source: CDC Morbidity and Mortality Weekly Report
Out-of-School Adolescents in Southwestern Nigeria

Stages of Change in Condom Use

Percent

Pre-Contemplation
Contemplation
Preparation
Action
Maintenance
Relapse

Stage

Rural Female
Rural Male
Urban Female
Urban Male
Section B

Diffusion/Adopter Characteristics
Diffusion of Innovations

- Innovation as a product or idea
- Adoption as the process of individual behavior change
- Importance of networks and information flow in a community
Diffusion

Innovators early adopt | Early maj. | Fate maj. | Late adopters

[Graph showing the diffusion of an innovation across different adopter groups]
Adopter Characteristics

- **Innovators**
  - Actively seek new information
  - Willing to take risks
  - Have access to information and expertise outside the confines of the community
  - Characteristics such as age, beliefs, occupation at edge or outside “normal” for community
Adopter Characteristics

- Early adopters
  - Seek out new information, belong to organizations with a national base, either are or have access to technical experts, have higher incomes, generally younger, accept risks.
Adopter Characteristics

- The majority
  - Receptive to new ideas, but do not seek them, belong to local groups, not national associations, source of information that are valued are opinion leaders in the early adopter group, generally average income.
Adopter Characteristics

- **Late adopters**
  - Complacent, possibly skeptical, neighbors and mass media are sources of information, wait to see if others are successful with the innovation, older, security minded, lower incomes.
Factors that Influence Adoption

- **Characteristics of the innovation**
  - Cultural congruence
  - Complexity/simplicity
  - Benefits perceived
  - “Trialability” (logistics)
  - Competition/alternatives
Factors that Influence Adoption

- **Adopter factors**
  - Personal attributes: Age, gender, education, etc
  - Personality: Assertiveness, submissiveness

Continued
Factors that Influence Adoption

Communication factors

- Type of media: Indigenous, mass/electronic
- Familiarity with/perceptions of available media
Communication Factors Considered

Radio Use in Rural Nigeria

- **Education**—higher education = more listening
- **Gender**
  - Males listen to specific programs and news
  - Females have it on as background
Communication Factors Considered

Radio Use in Rural Nigeria

- Electricity—Listen more if town has electricity; batteries costly on regular basis
- Message recall—more of outbreak type—yellow fever; ORT, EPI more from clinic
More Factors that Influence Adoption

Change agent characteristics

- Homophily/heterophily—similar/different
- Flaskerund and Liu (1991) found that when clients and therapists shared a common language or ethnic origin, more sessions were held
- Personal attributes: Cultural competence, listening skills, etc
Cumulative Adoption Curve

Guinea Worm Filter Sales Peaked Early
Adoption of SSS/ORT
Safer Sexual Behaviors

- Homosexual-bisexual men and condom use
- Proportion in each stage remained the same over time—but there was some progress and some relapse
Factors Influencing Movement among Stages

- Self efficacy
  - Confidence that one can practice safer sexual behavior even in difficult circumstances, such as when under the influence of drugs or alcohol or in the company of a new sex partner
  - Odds ratio (OR) = 1.5; 95% confidence interval (CI) = 1.1–2.0
Factors Influencing Movement among Stages

- Perceived peer support
  - OR = 1.4; 95% CI = 1.0–2.0
Relapse Behavior

- AIDS rising again in San Francisco, sounding warning
  - The Sun: Saturday, July 1, 2000: Page 3A

- Epidemiology
  - The percentage of HIV-positive cases at anonymous testing centers nearly tripled between 1997 and 1999 to reach 3.7 percent

Continued
Relapse Behavior

- **Behavior**
  - Gay men in San Francisco who reported always using a condom during sex fell from 70 percent in 1994 to 54 percent in 1999

- **Antecedent**
  - New AIDS drugs have made the disease seem less threatening
Section C

The PRECEDE Framework
The Acronym

- **P**redisposing
- **R**einforcing and
- **E**nabling
- **C**auses in
- **E**ducational
- **D**iagnosis and
- **E**valuation
The PRECEDE Framework

An Integration of Theories

- Quality of life diagnosis
- Health/epidemiological diagnosis
- Behavioral diagnoses
- Educational diagnoses
- Administrative/strategy diagnosis
- Evaluation process
Precede/Proceed: Full Picture of a Model

Phase 1
Social diagnosis

Phase 2
Epidemiological diagnosis

Phase 3
Behavioral and environmental diagnosis

Phase 4
Educational and organizational diagnosis

Phase 5
Administrative and policy diagnosis

Health Promotion

- Health education
- Policy regulation organization

Predisposing factors

- Reinforcing factors
- Enabling factors

Behavior and Lifestyle

Environment

Health

Quality of Life

Phase 6
Implementation

Phase 7
Process evaluation

Phase 8
Impact evaluation

Phase 9
Outcome evaluation
Guinea Worm Disease
Analysis Using PRECEDE

❖ Quality of life
  – Lower economic production, missed school, and reduced opportunities

❖ Epidemiological diagnosis
  – Prevalence of disease, disability, and secondary infections
Guinea Worm Disease
Analysis Using PRECEDE

- Behavioral diagnoses
  - Wading in water with open ulcer
  - Drinking water with infected cyclops
  - Alternatively: Filtering water to prevent
Educational Diagnosis

Predisposing Factors (Cognitive/Affective Determinants)

- Knowledge of guinea worm cause and prevention
- Attitude about water quality, purity: “Water has no enemy”
- Perceived efficacy: Filter cannot remove something already in the body
- Knowledge of correct use steps
- Preference viz: Alternative ways of “cleaning” water
Enabling Factors

Resources and Skills Needed

- Skills: Ability to follow correct use steps
- Supply: Easily available
- Cost: Price of a bottle of beer
- Time: Not take too long but is repetitive
Reinforcing Factors

*Social Influences, Feedback Mechanisms*

- Use promoted by village health workers who were selected by villagers
- Neighbors may purchase and use
Reinforcing Factors

*Social Influences, Feedback Mechanisms*

- Husbands may/may not buy
- Visible results removing dirt/debris
Predisposing Factors

Integrating Theoretical Concepts into Educational Diagnosis

- **HBM**
  - Knowledge as a modifying factor
  - Perceived threat and its components of perceived susceptibility and severity
Predisposing Factors

Integrating Theoretical Concepts into Educational Diagnosis

- **SLT**
  - Self-efficacy expectations
  - Outcome and value expectancies

- **TRA**
  - Attitudes towards the behavior
Integrating: Reinforcing Factors

- **HBM**
  - Cues to action as advice from significant others and observations of what is happening to others
  - Family structure and social group memberships as modifying factors
Integrating: Reinforcing Factors

- **SLT**
  - Social aspects of the environment
  - Observational learning of key others—For example, peers, family members

- **TRA**
  - Attitude toward reference groups
  - Perception of social norms
Integrating: Enabling Factors

❖ HBM

– Barriers/facilitators as logistical factors
– Economic status, occupation as modifying factors
Integrating: Enabling Factors

- **SLT**
  - Economic and political aspects of the environment
  - Skills as a person characteristic

- **TRA**
  - Not explicitly stated
Strategy Diagnosis
Matching Antecedent Factors with Strategies

- Communication strategies
  - Predisposing factors
  - Mass, interpersonal media, counseling, values clarification

- Social support strategies
  - Reinforcing factors
  - Support groups, peer education, family counseling

Continued
Strategy Diagnosis
Matching Antecedent Factors with Strategies

- Resource development strategies
  - Enabling factors
  - Skills training, community development, advocacy
<table>
<thead>
<tr>
<th>PRECEDE Administrative (Planning) Diagnosis</th>
<th>Educational Diagnosis</th>
<th>Behavioral Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication Strategies</strong>&lt;br&gt;Variety of mass media to promote awareness and clinic use: train drug shop keepers to educate youth</td>
<td><strong>Predisposing Factors</strong>&lt;br&gt;✓ Aware of methods&lt;br&gt;✓ Repro knowledge&lt;br&gt;✓ Favor premarital sex&lt;br&gt;✓ Attitude towards contraception&lt;br&gt;✓ Listen radio regularly&lt;br&gt;✓ Prefer clinic Rx than drug shop</td>
<td><em>(Urban youth in Ghana and Nigeria)</em></td>
</tr>
<tr>
<td><strong>Social Support Strategies</strong>&lt;br&gt;Work with clubs and through religious organizations; use of peer education</td>
<td><strong>Reinforcing Factors</strong>&lt;br&gt;✓ Talked w/someone about repro health&lt;br&gt;✓ If mother more educated&lt;br&gt;✓ If Christian (not Moslem indigenous)&lt;br&gt;✓ Live outside parent home&lt;br&gt;✓ Member social club</td>
<td><em>Use of modern contraceptive methods</em></td>
</tr>
<tr>
<td><strong>Developmental Strategies</strong>&lt;br&gt;Organize low-cost revolving fund scheme for commodity purchase distribution</td>
<td><strong>Enabling Factors</strong>&lt;br&gt;✓ Have money, drink beer&lt;br&gt;✗ Lack parent support&lt;br&gt;✗ See high cost clothes&lt;br&gt;✗ Self-supporting</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table outlines strategies and factors for addressing reproductive health issues among urban youth in Ghana and Nigeria, focusing on education, social support, and development.
Sudden Infant Death Syndrome

- SIDS educational campaign
- “Back to Sleep”

Source: First Candle/SIDS Alliance, 800-221-7437
Sudden Infant Death Syndrome

- Based on evidence that the behavior of placing an infant on its back for sleeping reduces risk of SIDS
- Next need to analyze the behavior

Source: First Candle/SIDS Alliance, 800-221-7437
<table>
<thead>
<tr>
<th>Admin Diag</th>
<th>Ed Diag</th>
<th>Beh Diag</th>
<th>Epid Diag</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication:</strong></td>
<td><strong>Predisposing:</strong></td>
<td><strong>Sleeping Position</strong></td>
<td><strong>Post-hoc application of PRECEDE to SIDS Program</strong></td>
</tr>
<tr>
<td>‘Back to Sleep’ media campaign</td>
<td>Norms, accepted practices to let infants sleep on stomach</td>
<td>Prior – 30-70% parents place infants on stomach to sleep</td>
<td>SIDS Most common age 1-12 months. Eval: reduced 38% after intervention</td>
</tr>
<tr>
<td>provided info on sleeping position</td>
<td>Attitude that sleeping on stomach is best</td>
<td>After – reductions to 24%</td>
<td></td>
</tr>
<tr>
<td><strong>Social Support:</strong></td>
<td><strong>Reinforcing:</strong></td>
<td><strong>Decay within months</strong></td>
<td><strong>Non-Behavioral:</strong></td>
</tr>
<tr>
<td>Media campaign used physicians and nurses as authority figures</td>
<td>Advice from family, friends, hospital staff.</td>
<td><strong>Differential:</strong> less effective if mother age 20-29, Afr Am, low income, inner-city, live south, mid-Atlan</td>
<td>Age of child, maternal age, cold weather, low birth weight</td>
</tr>
<tr>
<td>Staff Training so model proper way to put infant to sleep</td>
<td>Grandmother in home</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Developmental:</strong></td>
<td><strong>Enabling:</strong></td>
<td><strong>Infant’s own responses to sleeping position</strong></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>Not Applicable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## PRECEDE and ORT: Health Worker Behavior Can Be Analyzed, Too

<table>
<thead>
<tr>
<th><strong>Strategy Diagnosis</strong></th>
<th><strong>Educational Diagnosis</strong></th>
<th><strong>Behavioral Diagnosis</strong></th>
<th><strong>Epidemiological Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication:</strong></td>
<td>Predisposing factors:</td>
<td></td>
<td>Dehydration may be prevented and child recovers vs. other conditions.</td>
</tr>
<tr>
<td>Information at in-service training programs from professional literature</td>
<td>Knowledge about correct prescribing of anti-diarrheal drugs; Belief in efficacy of drugs for diarrhea vs. ORT; Knowledge about correct prescribing of antimicrobial drugs</td>
<td>Use of ORT vs. prescribing anti-diarrheal and antimicrobial drugs</td>
<td>Diarrhea is prolonged and antibiotic-associated diarrhea may set in</td>
</tr>
<tr>
<td><strong>Social support:</strong></td>
<td>Reinforcing factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supportive supervision, community education to change patient preferences, guidelines from professional association</td>
<td>Need to agree with social expectations of physician’s role; Desire to satisfy mothers’ perceptions of what other health staff would do/expect; Pressure from drug sales people</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Development:</strong></td>
<td>Enabling factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishment of ORT corners and provision of ORS and other fluids</td>
<td>Type of formal training and skill level—E.g., pediatrician or no time given to individual case management availability of ORT/ORS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Educational Diagnosis and Breast Self-Examination

- Predisposing factors
  - High levels of self-confidence to perform BSE
  - Awareness of mammography as a backup diagnostic tool
  - Knowledge of risk factor—especially parity
Educational Diagnosis and Breast Self-Examination

- Predisposing factors
  - Desire to seek reconstruction of the breast should surgery be necessary
  - Education level: higher the level the more likely

Continued
Educational Diagnosis and Breast Self-Examination

- Enabling factors
  - Skill in doing BSE at right time of month
  - Adequate time to do BSE

- Reinforcing Factors
  - Messages from clinicians
  - Influence of skills teacher
Integrating PRECEDE and Stages

*Childhood Diarrhea*

- **Precontemplative**
  - Diarrhea has started in child but is not recognized as serious yet by parent/caregiver
Integrating PRECEDE and Stages

*Childhood Diarrhea*

- Educational diagnosis
  - Focus on predisposing factors such as knowledge of diarrhea disease, dangers and recognition of symptoms, attitude toward seriousness, and value in taking action instead of passive observing
Precede and Stages

- **Contemplative**
  - Parent considers option to help child, seeks advice

- **Educational diagnosis**
  - Again, look at predisposing factors, including knowledge of options and procedures as well as perception of personal capabilities to undertake ORT
Precede and Stages

- Consider role of reinforcers: Social norms and support from potential advice givers

Planning and action

- The parent/caregiver begins to prepare appropriate home fluids and feedings
Precede and Stages

❒ Educational diagnosis

- Enabling factors, such as skills and availability of fluids and foods, are important here

- Reinforcing factors: Who else in household approves or not
Precede and Stages

- **Maintenance**
  - Parent continues to provide ORT throughout diarrhea episode and extra food afterwards
  - Parent uses ORT next time child has a diarrhea illness
Precede and Stages

- Educational diagnosis
  - Attention on reinforcing factors such as family support, attitude of spouse and elders, health worker encouragement, and other parents to serve as models
Programming Implications

- Putting diagnostic abilities to test
  - Multiple antecedent factors
  - Various segments of the population
  - Different levels/stages of change
- Multi-strategy approach