

## Community Health Evangelism and AIDS in Africa

- I. General
  - Incurable, contagious, virtually fatal
  - Costly disease
  - Consider disease and CHE's role - theory
- II. Role of Community Health Evangelism
  - Attributes
    - Emphasizes prevention (ie AIDS) at the family level – recurrent home visits
    - Married with strong evangelism and discipleship – changes the heart and motivation
    - Owned and operated by the community from the beginning – individual or family is the producer of health
    - Community is facilitated by outsiders to form their own program not managed by outsiders
    - Sustainable – CHE workers / local trainers are volunteers. Concept is applicable worldwide.
  - Role of a facilitator
    - Transfers relevant technical knowledge
    - Introduces the gospel
    - Encourages the change of risky behaviors
  - 3 main groups of people in a CHE program
    - CHE trainers – Christians trained to facilitate communities to start their own programs
    - Community Committee – manages the CHE project for the community.
    - Community Health Evangelists
      - Trained by the trainer in relevant physical and spiritual topics (ie AIDS prevention). Usually takes 6 months to fully train. (ie use of Edward the Elephant AIDS materials)
      - Assigned 25 – 50 homes to regularly visit.
      - Each visit the CHE shares a physical and spiritual topic
      - CHE's start Bible studies for the spiritually hungry
      - Introduce the new converts to an evangelical church.
  - Does CHE work in changing addicting behaviours? Yes (example – community where alcoholism dropped from 70 – 30%)
- III. Epidemiology
  - Focus of AIDS program – prevent high – risk behaviors
  - 77 - 89% all AIDS worldwide is found in Africa
    - 33 million people in sub-Saharan Africa currently infected
    - From the onset of infection to disease manifestation – 11 years or more
    - Survival after disease onset – 5-14 months
    - Current rate of increase in cases – 20% per year
    - By 2021 Africa will lose 245.12 million
  - AIDS impacts Africa in many ways
    - 1.7 million children orphaned by AIDS in sub-Saharan Africa (90% of the world's AIDS orphans are in sub-Saharan Africa)
    - 2008 – 15.44 million
    - 2018 – 94.2 million
    - Must act now
  - Global trends
    - Highest infection rate 15 – 24 year old age group
    - 35 X increased childhood AIDS in developing vs developed countries
    - 75% of new cases due to heterosexual contact

Group	Percent
Heterosexual contact	75%

Homosexual contact	10%
Transfusion	3-5%
Contaminated injection equipment	5-10%

- Major focus of AIDS prevention - six main areas
  1. Vaccine development - needs more research
  2. General blood and secretion precautions
  3. Elimination of high risk behaviour -CHE
  4. Improved prenatal and perinatal care (decrease lbw and premature infants)
    - Prenatal vitamins (Vit A ?) -CHE
    - Aggressive Rx of STD's
    - Increased use of c-sections
    - Decrease invasive procedures during pregnancy and delivery - amniocentesis, episiotomy, forceps, scalp electrodes, vacuum extractors.
    - Use experienced centers for prenatal and perinatal care.
  5. Control breast feeding in HIV positive mothers -CHE
  6. Prophylaxis for pregnant mothers and newborns -CHE
- III. Prevent preadolescent high risk activities
  - A. C. Everett Koop – Prior US Surgeon General – guidelines to prevent AIDS
    1. Abstain from sex until marriage – best
    2. After marriage only have sexual relations with your spouse
    3. If a person refuses to do the above they should avoid sex with those known to be or at risk of being infected with AIDS and when having sexual relations use condoms
    4. Target the preadolescent with education to prevent high – risk behavior
  - B. Does Education alone significantly affect sexual behavior of preadolescents?
    - Pediatrics, 1987; 79:825-28
      - Despite AIDS education - correct AIDS knowledge - markedly deficient
      - 15% of 16-19 yo changed sexual behaviour due to AIDS risk
      - 20% changes were appropriate
    - MMWR, 1988;37:133-38, MMWR, 1991;40:792
      - Study of homosexuals practicing anal intercourse - use of condoms
      - Condom use increased from 1% (1981) to 79% (1987)
      - Decrease - STD and AIDS
    - Pediatrics, March, 1989; pp375
      - 5 sex education programs - evaluated
      - No change in sexual behaviour - teenage pregnancy (increase 13%)
    - NEJM, 1989;322:821-25
      - Study condom use - sexual partners - college aged women
      - Modest increased use - 6% (1975) to 25% (1989)
      - 75% unprotected
    - JAMA, 1990; 263:3155
      - Study - college students
      - 70% appropriate knowledge of AIDS
      - 61-64% appropriate knowledge of other STD's
      - Conclusion - "neither knowledge of HIV disease or STD, nor fear of acquiring AIDS or STD significantly influenced student sexual behaviour".
    - Pediatrics, 1992;89:197-202
      - Study of condom use in adolescents
      - Conclusion - HIV knowledge did not increase condom use.
    - Int Conf AIDS, 1992;8:D411
      - Mozambique
      - Low rates of condom use despite high level of AIDS knowledge.
    - Int Conf AIDS, 1996;11:245

- Had 5 basic sessions on sex and drug educations via health educators in 7<sup>th</sup> grade and 8 sessions taught by peers in the 9<sup>th</sup> grade focusing on abstinence
- Intervention group were 3X less likely to have initiated vaginal intercourse and practiced safer sex.
- Am J Comm Psychol, 1999;27:161-87
  - Those receiving HIV risk – reduction interventions – more favorable behavioral beliefs about condoms, greater self-efficacy, and stronger condom use intentions post intervention
- J Adol Health, 1999;25:52-61
  - Namibia
  - Given 14 face to face sessions emphasizing abstinence and safer sex
  - Intervention group believed they could be intimate without sex, could explain how to use a condom
- Summary
  - Current AIDS education works with high risk groups (homosexuals)
  - Doesn't work well enough with adolescents
    - Feel invulnerable? That's why they are good soldiers?
- C. What can be done to decrease preadolescent high – risk behavior?
  - Study of the 5 most successful substance abuse programs in the US – 1989
  - Relates to other behavior change programs
  - 4 common principles
    1. Emphasis on abstinence
    2. Family involvement
    3. Adequate duration, intensity and program structure
    4. An emphasis on values and appropriate life styles
- D. CHE involvement
  - Impacts all of the 4 common principles
  - Great mechanism to disseminate information – AIDS booklets like Edward the Elephant
  - Reaches the whole family with AIDS prevention message recurrently – face to face
  - Emphasize evangelism and discipleship – God can help a person to be holy

#### IV. Vertical Transmission

##### A. Pediatric AIDS

- 6th leading cause of death (15-24 yo).
- USA - 1996 - Pediatric AIDS cases

• <b>Group</b>	• <b>Percentage</b>
• Mothers with AIDS or at risk of AIDS	• 88% (90% - developing countries)
• Hemophila / coagulation disorder	• 2%
• Blood trasfusion / tissue exposure	• 2%
• Unknown	• 8%

- Most cases - vertical transmission - mother to child
  - 2/3 before or during birth - AZT prophylaxis, Neviripine, Combination
  - 1/3 breast feeding
  - 77% vertical transmission - preventable
- Transmission rate of an HIV + mother to child - 12 - 43%
  - 1). Rupture of membranes > 4 hours
  - 2). Amniocentesis
  - 3). Preterm labor and delivery (< 34 wga - 3.80 odd's ratio)
  - 4). Low birth weight
  - 5). STD's with ulcers (chanchroid, syphillis, herpes)
  - 6). Birth order of twins (1st)
  - 7). Maternal vitamin A concentration
  - 8). CD4 <700

- 9). Maternal p24 antigen level
- 10). Advanced maternal disease
- 11). Vaginal delivery (c-section .56 odds ratio)
- 12). Procedures when not routine - episiotomy, scalp electrodes, forceps, vacuum extractors.
- 13). Traditional healing practices
- 14). Breast feeding

B. Breast feeding considerations

- 1). Transmission 8-42%
- 2). Increased transmission
  - Duration of breast feeding (Increase in transmission rate 1m - 45%, 2m - 64%, 3m - 75%)
  - New infection - lactating - 26%, prior infection 8-18%
- 3). WHO, UNICEF, UNAIDS
  - Encourage all HIV neg or unknown status to breast feed
  - Known HIV + mother (must do testing in mother) - inform of breast feeding risks
  - Find breast feeding options - Breast milk substitute (must have clean water)
  - Alternate sources not available - dc breast feeding at 6 months.
- 4). Additional considerations
  - Decrease childhood infectious diseases - immunizations, sanitation, hygiene, clean water, early curative care – (microcosm of health around existing clinics and hospitals)
  - PCR, Viral cultures and p24 antigen - expensive, unavailable consider - repeat screen (ie ELISA) at 6-18 months old.

C. Community Health Evangelism considerations

- Must have an accessible clinical facility - (early curative care, HIV testing)
- Effective recurrent home visits could impact the following
  - Identify pregnant women
  - Arrange for HIV testing and follow-up
  - Encourage prophylactic antiviral treatment
  - Encourage formula usage and distribution
  - Encourage appropriate general preventive measures (immunizations, sanitation, ORS use)
  - Encourage early curative treatment of sick infants
  - Arrange for HIV testing at 6 - 18 months for children
  - Encourage appropriate birth control for HIV positive mothers
- HIV testing
  - Rapid tests most desirable (ie Dipstick HIV 1 and 2)
    - Cost - \$.50 – 4.00 / test
    - Sensitivity / Specificity – same as with ELISA
    - Assay time – 3 minutes – 3 hours 5 minutes
  - Test infant at 6 –18 months. 6 months probably adequate
  - Repeat the rapid test to confirm a + particularly where the prevalence is low (<10%)
  - PPV based on Prevalence (Test with Sensitivity 99.9% and Specificity 99.6%)

HIV Prevalence	PPV
10%	96%
5%	91%
2%	80%
1%	67%
0.5%	50%
0.3%	38%
0.1%	18%

- Prophylactic regimens

Antiviral	Protocol	Percent reduction in HIV transmission		Cost	Comments
		No Breast Feeding	With Breast Feeding		
AZT (long)	Early ap, ip(IV), nb X6w	67.5%	50.6%	\$1318.95	Too expensive
AZT (short)	Ap from 36w, ip, nbX6w	77.1%	57.8%	\$362.94	
AZT (short)	Ap from 36w, ip (po q3h)	50.1%	37.2%	\$339.20	AZT – 300 mg po bid and q3h during labor
AZT	Ip, nbX6w	62.5%	46.9%	\$44.95	
AZT	Ip, nbX7d	32.6%	24.5%	\$22.20	AZT – 600 mg at labor, then 300 mg q3h until delivery. 4 mg / kg po bid X 7 days for the nb.
AZT	Nb within 48h X6w	65.1%	48.8%	\$23.75	
AZT	Nb started after 3d X6w	30.9%	23.2%	\$23.75	
Nevirapine	Ip (1dose), nb (1 dose)	70.8%	61.1%	\$4.83	Probably the best all around. Uganda study

1. Testing of infants 16w to 6 months. Uganda study used PCR at 16 weeks.
2. Nevirapine – 200 mg at onset of labor and 2 mg / kg to the newborn within 72 hours of birth.

- Formula costs
  - Assume 324 quarts used in 1 year
  - Cost of powdered formula - \$5.58-6.85 / 2.7 quarts or approximately \$2.30 / quart
  - ½ year of formula - \$372.60
  - 1 year of formula - \$745.20
- Cost considerations
  - Assumptions
    - Community of 5000, with 2500 children, 2500 adults and 1250 women at reproductive age
    - 12% prevalence (i.e Kenya) of HIV = 150 adult women of reproductive age with HIV or 300 risk pregnancies over 4 years or 75 per year.
    - 27.5 % vertical transmission rate or 21 vertical transmissions per year
    - With 61% prevention (Nevirapine + breast feeding) - 13 HIV cases could be prevented per year
    - Pregnancy of all susceptible women every 2 years = 2500 pregnancies in 4 years or 625 per year
    - \$.50 per HIV test = \$312.50 / year / pregnant mothers. \$312.50 / year / child at 6 months. Total = \$625. Retesting of positives \$37.50 / year.
    - Nevirapine costs = \$4.83 / course or \$362.25 per year
    - Formula costs
      - Assume 1 qt per child per day or 324 quarts per year
      - Cost \$2.30 per quart or \$745.20 for 1 year / at risk child
      - For 75 at risk babies per year = \$55,890 / year / community of 5000 or \$27945 / 6 months
      - Too expensive
  - Summary – yearly costs
    - \$350.00 – Preliminary testing and retesting of positives
    - \$362.25 – Nevirapine costs
    - \$312.50 – Post testing of the baby

- \$1024.75 – to prevent 13 vertical transmission cases of AIDS per year in a community of 5000 persons
- \$78.83 to prevent one HIV case in a child – Is it worth it?
- With formula - \$1931.32 – \$3794.32 to prevent one case in a child (assuming 15 cases prevented per year)