Literature Review:
Reasons children are not vaccinated in low and middle income countries

Country Facts Sheets & Global Matrix
October 1, 2009
Description:

The following pages list reasons/factors associated with un- or under- vaccinated children from peer-reviewed articles published between 1999 and 2009 identified from Medline and non-Medline databases. Listing order does not reflect importance or magnitude. A summary is provided to highlight most frequently cited reasons/factors.

Definitions:

Reason/factor categories from Vaccines, 3rd edition

1) Immunization Systems:
   --Access and vaccine service availability
   --Use of all opportunities
   --Cost and service quality
   --Health worker knowledge

2) Communication and Information:
   --Media messages regarding vaccinations
   --Community involvement in EPI
   --Trust in health service provider

3) Family characteristics:
   --Education level (of mom and dad)
   --Family size
   --Income, occupation
   --Ethnicity/language group

4) Parental Attitudes and Knowledge:
   --Perceived benefit of vaccines
   --Perceived disease threat
   --Group pressure for or against vaccinations

Sources:

Population estimates from:

DTP3 Coverage estimates from:

Institute of Health Metrics and Evaluation, DTP3 Coverage (Global),
(http://www.healthmetricsandevaluation.org/resources/datasets/dtp3/dtp3_data.php)
Afghanistan

**Total population:** 28,395,716  
**Population < 5 years of age:** 4,319,222  
**Estimated Routine Coverage (2006 DPT3):** 65% (95% CI 34%–89%)  
**Number of relevant articles:** 1

**Summary of reasons/factors linked to unvaccinated children:**  
See below

**Immunization Systems:**  
--Insecure areas limited access/delivery of immunization services

**Communication and information:**  
--None identified

**Family Characteristics:**  
--None identified

**Parental Attitudes and Knowledge:**  
--None identified
Angola

**Total population:** 12,799,293  
**Population < 5 years of age:** 2,134,188  
**Estimated Routine Coverage (2006 DPT3):** 41% (95% CI 17%– 70%)  
**Number of relevant articles:** 1

**Summary of reasons/factors linked to unvaccinated children:**  
Weak routine immunization program, primarily due to civil conflict and affecting certain ethnic groups

**Immunization Systems:**  
--Civil conflict (war) linked to low vaccine coverage  
--Proximity to conflict linked to low vaccine uptake  
--Living in rural area linked to low vaccine uptake, especially during civil conflict

**Communication and information:**  
--No radio ownership linked to low vaccine uptake

**Family Characteristics:**  
--Belonging to minority ethnic group linked to low vaccine uptake and access to health services  
--Male headed household linked to low vaccine uptake (compared to female headed household)  
--Low education level linked to vaccine uptake  
--Low socio-economic factors linked to low vaccine uptake

**Parental Attitudes and Knowledge:**  
--None identified
Argentina

Total population: 40,913,584
Population < 5 years of age: 3,619,567
Estimated Routine Coverage (2006 DPT3): 83% (95% CI 41%–97%)
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
Children of families without insurance and other factors (large sibship size and low education level) at highest risk

Immunization Systems:
--Lack of health insurance
--Living in certain zone in city
--Uninsured caregiver
--Children served by public health facilities (compared to private clinics)
--Children not attending day care linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Low socio-economic status of family
--Low educational level of head of household
--Children living in households without running more likely to be under vaccinated
--Birth order
--Low parental education
--Born later in the sibship linked to low vaccine uptake (not being born first)
--Lower education level of caregiver
--Having single parent family linked to lower vaccine uptake
--Shortage of money in the household

Parental Attitude and Knowledge:
--Illness of child
Bangladesh

Total population: 156,050,883  
Population < 5 years of age: 18,276,825  
Estimated Routine Coverage (2006 DPT3): 91% (95% CI 86% - 94%)  
Number of relevant articles: 11

Summary of reasons/factors linked to unvaccinated children:  
Weak immunization services in hard to reach/remote locations and poor knowledge level regarding vaccinations among caregivers

Immunization Systems:  
--Lack of intensive outreach services  
--Residing in a rural settlement linked to low vaccine uptake  
--Distant proximity (> 2 miles) to outreach clinic linked to low vaccine uptake  
--Lack of health care worker in community  
--Clinic staff providing only one service at a time (no integration)  
--Missed opportunities among children living close to clinic (< 1 km) but in family with many siblings (> 2 children)  
--Children living in rural areas less likely to be fully vaccinated - poor access to outreach clinics  
--Children in urban slums less likely to be fully vaccinated  
--Children living in areas prone to seasonal flooding linked to low vaccine uptake  
--Low health care staff to population ratio linked to low vaccination coverage (a large number of unfilled field positions remain vacant for several years)  
--Children of families living in locally owned tea estates less likely to be fully vaccinated (compared to children living on foreign born owned estates)  
--Irregular or cancelled EPI sessions linked to lower coverage  
--Inadequate time spent at EPI spots (due to travel time) linked to lower coverage, geographic barriers  
--Accessibility to health center, far distance  
--Health promoter did not want to provide services to the poorest clients

Communication and Information:  
--Lack of interaction between caregivers and health care workers  
--Poor behavior of health care workers  
--Families with no exposure to mass media were less likely to have immunized children  
--Low coverage linked to limited awareness of EPI sessions
--Low coverage due to lack of community involvement in EPI program

**Family Characteristics:**
--If no outreach services, mothers' low education level linked to low vaccine uptake
--Less than primary school education level of mother linked to low vaccine uptake
--Poorer households linked to low vaccine uptake
--Lower maternal education level of mother linked to low vaccine uptake (less than secondary school)
--Children of fathers in unsalaried jobs less likely to be fully vaccinated
--Belonging to minority ethnicity or religious group (lower caste-Hindu) linked to lower vaccine uptake
--Low economic status linked to poor access to health services (e.g. transportation to clinic, etc.)
--Family issues
--Parents with less education were less likely to have immunized children
--Being poor linked to low vaccine uptake
--Illiterate mother

**Parental Attitudes and Knowledge:**
--If no outreach services, female gender linked to low vaccine uptake
--Lack of interaction between caregivers and health care workers
--Being female gender linked to low vaccine uptake
--Lack of awareness among mothers about availability of specific health services and health needs
--Limited emancipation of women linked to low vaccine uptake (conservative attitudes towards women)
--Parents lack of information
--Lack of motivation
--Mother's poor knowledge about benefits of complete vaccination
--Lack of parental awareness on importance of immunizations
--Lack of parental awareness regarding number of subsequent doses needed to be fully vaccinated
--Lack of awareness for timing of service delivery
--Lack of awareness regarding age at which vaccines should be received
Benin

**Total population:** 8,791,832  
**Population < 5 years of age:** 1,522,774  
**Estimated Routine Coverage (2006 DPT3):** 68% (95% CI 56% - 78%)  
**Number of relevant articles:** 2

**Summary of reasons/factors linked to unvaccinated children:**  
Poor knowledge and understanding of benefits of immunizations among caregivers, role of anti-vaccination promotion among certain religious groups

**Immunization Systems:**  
--Missed opportunities to vaccinate  
--Poor knowledge of health worker regarding immunization services  
--Lack of household resources to travel to clinic/hospital (related to low utilization of general health services)

**Communication and Information:**  
--Caregivers being uncomfortable with hospitals/staff (related to low utilization of general health services)  
--Behavior of health officials were tactless and negative  
--Poor communication between staff and caregivers (related to low utilization of general health services)

**Family Characteristics:**  
--None identified

**Parental Attitudes and Knowledge:**  
--Traditional beliefs, culture, religious practices (related to low utilization of general health services)  
--Religious followers (Christian) reject vaccinations due to only God protects children  
--Religious followers (Christian) believe that vaccinations make children sick (misinformation)  
--Religious followers (Christian) believe that vaccinations are made by 'white witch doctor'  
--Religious followers (Christian) believe vaccinations are 'poison'  
--Religious leaders promote non-vaccination beliefs
--Culturally against oral vaccines, if no scar, not beneficial
--Mothers hate bureaucratic hassles including expenses for travel
--Mothers' lack of information on vaccinations (vaccinations cause anemia)
Botswana

**Total population:** 1,990,876  
**Population < 5 years of age:** 226,170  
**Estimated Routine Coverage (2006 DPT3):** 97% (95% CI 90%– 99%)  
**Number of relevant articles:** 1

**Summary of reasons/factors linked to unvaccinated children:**  
Poor access to services and information on immunizations

**Immunization Systems:**  
--Distance to health care worker linked to low vaccine uptake  
--Hard to reach children neglected due to competing demands of health system  
--Clinic hours not convenient for caregivers  
--Drops-out due to frequent movement or seasonal relocations  
--Shortages of vaccines (stock-outs)  
--Missed opportunity as health care workers not checking immunization status of children during curative visits  
--Lack of human and material resources for immunization services (diverted by HIV)

**Communication and information:**  
--Need for additional doses not communicated adequately to parents (do not understand)  
--Negative attitudes of health care workers

**Family Characteristics:**  
--None identified

**Parental Attitudes and Knowledge:**  
--Parents refuse vaccinations due to religious reasons
Brazil

Total population: 198,739,269
Population < 5 years of age: 17,974,073
Estimated Routine Coverage (2006 DPT3): 90% (95% CI 74% - 98%)
Number of relevant articles: 6

Summary of reasons/factors linked to unvaccinated children:
A number of missed opportunities to vaccinate children and caregivers’ low knowledge level regarding benefits of vaccinations

Immunization Systems:
--Lack of vaccines
--Lack of integrated health services linked to missed opportunities for vaccination
--Poor/inefficient neonatal services linked to low vaccine uptake
--Missed opportunities by community pediatricians

Communication and Information:
--Lack of communication related to location and timing of vaccination services
--Limited exposure to media linked to low vaccine uptake

Family Characteristics:
--Low education level of mother linked to low vaccine uptake
--Larger number of siblings (> 3) linked to low vaccine uptake
--Parents with lower income less likely to have fully vaccinated children
--Occupation of caregiver influences vaccine uptake

Parental Attitudes and Knowledge:
--Immunizations are a low priority to parents
--Limited awareness among mothers regarding immunizations
--Mother's fear of subjecting their children to injections (feeling sorry for child)
--Empathy or feeling sorry for child linked to low vaccine uptake
--Lack of awareness/education about vaccinations
Burkina Faso

Total population: 15,746,233
Population < 5 years of age: 2,881,107
Estimated Routine Coverage (2006 DPT3): 78% (95% CI 58% – 92%)
Number of relevant articles: 5

Summary of reasons/factors linked to unvaccinated children:
Mothers with low education and income levels most likely to not completely vaccinate their children, limited knowledge and many misconceptions about vaccinations, missed opportunities when child does not have a vaccination card

Immunization Systems:
--Limited provider's experience linked to low vaccine uptake (do not want to open new vial)
--Lack of vaccine supply linked to low vaccine uptake
--Lack of pre-natal care linked to low vaccine uptake
--Lack of resources at district level
--Having to pay for vaccination card
--Children without a vaccination card linked to low vaccine uptake (not being completely vaccinated)

Communication and Information:
--Having the perception of communication problems with health workers linked to low coverage (not being completely vaccinated)

Family Characteristics:
--Mother's with low education level linked to low vaccine uptake
--Low education level of mother
--Low family income linked to low vaccine uptake
--Low income linked to low vaccine uptake
--Family's poor economic status linked to low vaccine uptake (not being fully vaccinated)

Parental Attitudes and Knowledge:
--‘Parents don't care for their children's health’
--Vaccinations are too complex and constraining procedure (difficult to obtain and keep vaccination card)
--Parents reject vaccinations
--Parental misconception and lack of knowledge about immunizations, appropriate age to get child vaccinated
--Lack of information regarding immunizations
--Family is traveling or not at home when vaccinations are scheduled
--Child was sick and was not vaccinated
Cambodia

Total population: 14,494,293
Population < 5 years of age: 1,654,489
Estimated Routine Coverage (2006 DPT3): 78% (95% CI 62% - 89%)
Number of relevant articles: 4

Summary of reasons/factors linked to unvaccinated children:
Children living in remote or rural areas linked to low vaccine uptake

Immunization Systems:
--Increased use of private health clinics where vaccinations are refused due to cost (still free at public clinics)
--Lack of knowledge among health workers regarding correct vaccination schedule and timing (intervals between vaccinations)
--Distance to health facility (living more than 1 hr away from facility)
--Weak or limited technical support/assistance to district health department
--Migration, population mobility linked to low vaccine uptake
--Geographic reasons, far distance to clinic/hospital for immunization services
--Economic reasons/constraints linked to low vaccine uptake
--Where the child lives
--How health care is managed, contractors or government health care linked to lower coverage

Communication and Information:
--None identified

Family Characteristics:
--Poverty of family

Parental Attitude and Knowledge:
--Low mothers’ knowledge level regarding vaccinations linked to low vaccine uptake
--Fear of Adverse Events linked to low vaccine uptake
Cameroun

Total population: 18,879,301
Population < 5 years of age: 2,885,955
Estimated Routine Coverage (2006 DPT3): 75% (95% CI 63% - 84%)
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
Caregivers with low education and socio-economic levels linked to low vaccine uptake, children living in rural areas also at risk of low vaccine uptake

Immunization Systems:
--Living in rural area linked to low vaccine uptake, especially if mother has low education level
--Caregivers in rural areas were less likely to have vaccinated children
--Less supervisory visits to health facilities and facility level planning

Communication and Information:
--None identified

Family Characteristics:
--Low education level of caregivers linked to low vaccine uptake
--Caregivers with a lower level of education were less likely to vaccinate their children
--Low maternal education level
--Low socio-economic status

Parental Attitude and Knowledge:
--Parents don't perceived benefit of immunizations
--Low efficacy among child's caregivers regarding getting child vaccinated
--High perceived susceptibility and severity of disease linked to low vaccine uptake (fatalism)
--Caregivers with a high perception of susceptibility and severity were less likely to vaccinate their children (fatalism)
Chad

**Total population:** 10,329,208
**Population < 5 years of age:** 1,808,388
**Estimated Routine Coverage (2006 DPT3):** 35% (95% CI 17%– 58%)
**Number of relevant articles:** 1

Summary of reasons/factors linked to unvaccinated children:
See below

**Immunization Systems:**
--None identified

**Communication and information:**
--None identified

**Family Characteristics:**
--None identified

**Parental Attitudes and Knowledge:**
--Lack of awareness among parents regarding benefits of vaccination
Chile

Total population: 16,601,707
Population < 5 years of age: 1,216,841
Estimated Routine Coverage (2006 DPT3): 86% (95% CI 46%– 98%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Economic reasons linked to low vaccine uptake
--Hospitalized or chronically ill children less likely to be vaccinated

Communication and information:
--None identified

Family Characteristics:
--None identified

Parental Attitudes and Knowledge:
--Poor parental recall for vaccinations
China

**Total population:** 1,338,612,968  
**Population < 5 years of age:** 86,270,550  
**Estimated Routine Coverage (2006 DPT3):** 93% (95% CI 86% - 97%)  
**Number of relevant articles:** 6

**Summary of reasons/factors linked to unvaccinated children:**  
Living in poor, rural areas linked to low vaccine coverage, price of immunization and general health services perceived as barriers to obtaining vaccinations, being born at home and low maternal education linked to low vaccine uptake

**Immunization Systems:**  
--Few immunization service sessions per year  
--Fee immunization service linked to low vaccine uptake  
--Poor health insurance schemes for immunization services  
--Living in remote mountain regions linked to low coverage  
--Living in a rural and poor region linked to low vaccine uptake  
--Being born at home linked to low vaccine uptake  
--Being born in a township hospital (compared to county, provincial, or national hospital)  
--Residing in rural location  
--Live in poor rural areas, usually mountainous hard to reach areas by health services  
--Parents living in hard to reach areas can not access health services  
--Supply of vaccines linked to unvaccinated children  
--Economic burden on poor families regarding use of health care services linked to children not being fully vaccinated  
--Place of delivery, children born at home less likely to be vaccinated compared to children born in a hospital  
--Price of health service had negative impact on immunization uptake  
--Travel time in urban area had negative impact on immunization uptake  
--In rural area, travel time to clinic/health center linked to low vaccine uptake  
--Price of vaccine linked to low vaccine uptake

**Communication and Information:**  
--Lack of notification from providers to parents regarding need for/timing of vaccinations  
--Lack of TV/radio exposure linked to low vaccine uptake
Family Characteristics:
--Low SES level linked to low vaccine uptake
--Low education level of mother linked to low vaccine uptake
--Limited household wealth (socio-economic status, not having bicycle) linked to low coverage
--Mother's low education level linked to low vaccine uptake
--Migrant children linked to lower vaccine uptake compared to resident children
--Low mother's education had negative impact on immunization uptake
--Low income had negative impact on immunization uptake

Parental Attitude and Knowledge:
--Poor knowledge level of parents regarding immunizations linked to low vaccine uptake (e.g., danger of measles infection/disease)
--The risk of females having lower immunization uptake (decreasing over time)
--In rural area, being female linked to low vaccine uptake
Columbia

Total population: 43,677,372
Population < 5 years of age: 3,915,654
Estimated Routine Coverage (2006 DPT3): 86% (95% CI 75% - 93%)
Number of relevant articles: 5

Summary of reasons/factors linked to unvaccinated children:
Limited access to health services and belonging to a socially vulnerable group (poor, ‘non-Indian’, having a low education level) linked to low vaccine uptake

Immunization Systems:
--Missed opportunities
--Changes in vaccination schedule
--Vaccine supply issues (due to limited storage)
--Limited time spent with child linked to low vaccine uptake
--Increased bureaucracy linked to low vaccination coverage
--Lack of clear role of local health authorities linked to low vaccination coverage
--Lack of training, supervision, and monitoring at local level
--Lack of resources to maintain hardware (cold chain and vehicles) linked to low vaccination coverage
--Lack of personnel (health care workers) linked to low vaccination coverage
--Displaced persons due to civil conflict
--Residents in the North/Southwest less likely to be vaccinated than children living in the Southeast
--Not having a regular health care provider linked to low vaccine uptake
--Children displaced by armed conflict
--Less experienced health workers in clinic (< 14 years)
--Health worker mentioned that children were rejected for vaccination due to lack of supplies
--Poor accessibility to health services
--Low insurance coverage
--Not being affiliated with social security
--Increased number of vaccine contra-indications mentioned

Communication and Information:
--None identified

Family Characteristics:
--Low education level of head of household linked to low vaccine uptake
--Larger family size linked to low vaccine uptake
--Low education level of parents linked to low vaccine uptake, especially for older children in family
--Poverty
--Social vulnerability
--Large household size
--Low level of education for head of household
--Being a 'non-Indian'
--Low socio-economic status

**Parental Attitudes and Knowledge:**

--Multiple injections
--Issues regarding vaccine safety
--Parents lack of trust in vaccination site staff and safety in conflict zones
--Parents with less knowledge regarding provider's schedules and requirements for accessing services less likely to have fully vaccinated children
--Health worker perceived that community was afraid of vaccine side effects linked with being fully vaccinated
Congo

Total population: 4,012,809
Population < 5 years of age: 710,103
Estimated Routine Coverage (2006 DPT3): NA
Number of relevant articles: 4

Summary of reasons/factors linked to unvaccinated children:
Geographic distance to health facility and inadequate vaccine supply linked to low vaccine uptake, parents not knowledgeable about benefits of vaccinations

Immunization Systems:
--Children living in urban area (compared to peri-urban area) less likely to be vaccinated against measles
--Access to health facility, far distance linked to low vaccine uptake
--Lack of adequate supply of vaccine
--Child was sick and not vaccinated
--Vaccine was not available

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Parents lacked information regarding vaccinations
--Parents did not have time to take children to get vaccinated
Costa Rica

Total population: 4,253,877
Population < 5 years of age: 369,550
Estimated Routine Coverage (2006 DPT3): 86% (95% CI 64% - 98%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
Distance to health facility and low education/socio-economic status of parents linked to low vaccine uptake

Immunization Systems:
--Migration patterns at border
--Distance to health care facility

Communication and Information:
--None identified

Family Characteristics:
--Education of parent/caregiver
--Socio-economic status of family
--Maternal employment status

Parental Attitude and Knowledge
--None identified
Ecuador

Total population: 14,573,101
Population < 5 years of age: 1,495,279
Estimated Routine Coverage (2006 DPT3): 94% (95% CI 86% - 98%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--High cost of immunization services linked to low vaccine uptake

Communication and Information:
--Lack of media communication regarding importance of vaccinations

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--None identified
Ethiopia

Total population: 85,237,338
Population < 5 years of age: 15,782,678
Estimated Routine Coverage (2006 DPT3): 38% (95% CI 21% - 56%)
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
Living in rural area and distance to health clinic linked to low vaccine uptake, mothers with limited education and socio-economic capital placing children at-risk for vaccine preventable diseases

Immunization Systems:
--Distance to health care center/facility
--Residing in rural area linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Children born to rural-rural migrant woman
--Low level of mother's education
--Limited social/economic capital of mothers linked to low vaccine uptake

Parental Attitude and Knowledge:
--Low level of health care seeking behavior among mothers linked to low vaccine uptake
--Mother has limited role in family decision making linked to low vaccine uptake
Gambia

Total population: 1,778,081
Population < 5 years of age: 294,500
Estimated Routine Coverage (2006 DPT3): NA
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
Low education and socio-economic level of caregivers linked to low vaccine uptake

Immunization Systems:
--None identified

Communication and Information:
--In urban areas, lack or prior social connections with clinic staff and strong interpretation with woman linked to low vaccine uptake

Family Characteristics:
--In urban areas, living in poor compound, rented home, and no phone linked to low vaccine uptake
--In urban areas, mothers with less than five years of education linked to low vaccine uptake
--Woman with many children, children with born later (birth order) were less likely be fully vaccinated

Parental Attitude and Knowledge:
--Confusion on whether all vaccinations were received linked to low vaccine uptake
Georgia

Total population: 4,615,807
Population < 5 years of age: 236,909
Estimated Routine Coverage (2006 DPT3): 80% (56% - 94%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Lack of supportive supervision is linked to lower coverage

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--None identified
Ghana

Total population: 23,887,812
Population < 5 years of age: 3,195,280
Estimated Routine Coverage (2006 DPT3): 85% (95% CI 79% - 91%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Poor or lack of prenatal care
--Residing in a rural area linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Father's occupation linked to low vaccine uptake (i.e. laborer or agriculturist)

Parental Attitude and Knowledge:
--None identified
Guinea-Bissau

Total population: 1,533,964
Population < 5 years of age: 235,586
Estimated Routine Coverage (2006 DPT3): 64% (95% CI 50%– 76%)
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
Children with limited access and/or interaction with the health care system as well as belonging to certain ethnic groups less likely to be vaccinated

Immunization Systems:
--Greater traveling distance to clinic linked to low vaccine uptake
--Being away from home during the day linked to low vaccine uptake
--Child is ill or hospitalized
--Children with limited contact with health care system less likely to be fully vaccinated
--Children of mothers who did not receive the tetanus vaccine during pregnancy linked to low vaccine uptake
--Children born at home less likely to be fully vaccinated
--Malnourished children (small arm circumference < 125 mm) linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Low paternal education linked to low vaccine uptake
--Father's occupation, working in agriculture linked to low vaccine uptake
--Low socio-economic status linked to low vaccine uptake (e.g, roof type)
--Children born later in the sibship (> 4) linked to low vaccine uptake
--Children of older mothers linked to low vaccine uptake
--Children belonging to Balanta or Pepel ethnic groups linked to low vaccine uptake

Parental Attitude and Knowledge:
--None identified
Haiti

Total population: 9,035,536
Population < 5 years of age: 1,201,731
Estimated Routine Coverage (2006 DPT3): 56% (95% CI 42% - 69%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--None identified

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Use of traditional healers by mothers associated with lower child immunization uptake
Honduras

Total population: 7,833,696
Population < 5 years of age: 1,007,553
Estimated Routine Coverage (2006 DPT3): 94% (95% CI 89% - 96%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Monetary incentives increase immunization coverage, for first dose of DPT but not for measles

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--None identified
India

**Total population:** 1,156,897,766  
**Population < 5 years of age:** 118,660,782  
**Estimated Routine Coverage (2006 DPT3):** 56% (95% CI 43% – 69%)  
**Number of relevant articles:** 50

**Summary of reasons/factors linked to unvaccinated children:**
Strong immunization programs in rural or remote areas (distance to health clinic, travel costs, missed opportunities at clinics (absent vaccinator), no access to pre/ante-natal care. Belonging to low socio-economic status with low education level and/or low caste/minority group, and having limited knowledge/understanding of vaccinations linked to low vaccine uptake, fear and misconceptions of vaccinations affecting motivation to seek vaccinations, being female (especially in rural northern states)

**Immunization Systems:**
--Missed opportunity to vaccinate children when child is in clinic for illness  
--Health care workers do not screen children for vaccination status (missed opportunity)  
--Health care workers will not vaccinated if child does not have vaccination card  
--Children are not vaccinated following reports of previous convulsions or other adverse reactions following previous vaccinations  
--Long waiting time creates barrier to immunizations  
--Increasing dislocation of routine services  
--Inadequate resources to support routine programs (for personnel, transport, etc.)  
--Missed opportunity - child's vaccination status not checked by health worker  
--Health worker misinformed about vaccinations (contraindications)  
--Inadequate vaccine supply to offer to patients  
--Missed opportunity - health worker not available to provide vaccinations  
--Long wait times  
--Ill child (inaccurate contraindications)  
--Costs associated with vaccination linked to low vaccine uptake  
--Children born at home (outside and institution) more likely not to be vaccinated (no doses)  
--Children residing in rural areas linked to low vaccine uptake  
--High opportunity costs, including time to take children to clinic to get vaccinated (especially for girls)
--Missed opportunity - children visiting health clinic for curative purposes not offered vaccinations

--Health care workers incorrectly applied contraindications, resulting in missed opportunity for vaccination

--Child denied vaccination because health care worker refused to open vial to vaccine one child

--Health care worker not available to vaccinated child during health clinic visit

--Immunizations not considered priority during curative visits

--Poor access to healthcare services linked to low vaccine uptake

--Lack of adequate vaccine supply linked to low vaccine uptake

--Missed opportunity due to child's illness

--Refusal of health care worker to vaccinate child

--Residing in a rural area linked to low vaccine uptake

--Residing in poor state (northern region in India) linked to low vaccine uptake due to system failure

--Mother did not receive ANC services (and did not receive TT vaccine)

--Not being born in institution linked to low vaccine uptake

--Limited access to health clinic due to distance (> 5 km) linked to low vaccine uptake

--Parents cited 'obstacles' in getting children vaccination (no elaboration)

--Missed opportunity due to negligence of provider

--Missed opportunity due to contraindications

--Missed opportunity due to 'carelessness' or 'misconception' of mother

--Lack of antenatal care linked STRONGLY to low vaccine uptake

--Being born at home linked to low vaccine uptake

--Health worker refused

--Lack of available fixed health infrastructure

--Far distance to health facility linked to low vaccine uptake

--Living in poor district linked to low coverage

--Residing in rural area linked to low coverage

--Limited antenatal care by mothers linked to lower vaccine uptake

--Vaccination center too far away

--Missed opportunity, health care worker did not vaccinate children

--Rude health care workers

--Indirect costs associated with seeking vaccination create barriers to getting children vaccinated (travel costs, income lost, etc.)

--Public health system linked to inadequate services

--Residing in a rural environment linked to low vaccine uptake

--Living far away from primary health clinic linked to low vaccine uptake

--Limited access to public and private health services among poor

--Rural-urban differences in vaccination patterns
--Geographic differences between states
--Weak immunization performance/inadequate services in poor/rural areas
--Vaccinator not present
--Lack of immunization services in community
--Residing in a rural area
--Parents reported many obstacles to getting children vaccinated
--Residing in a rural area linked to low vaccine uptake
--Children living in slum area are linked to low vaccine uptake
--Location of facility creates obstacle, too far away (children in small and remote villages)
--Absent vaccinators
--Lack of immunization card
--Not being born in hospital
--Absence of vaccinator
--Immunization site too far away (in rural area)
--Missing vaccination card
--Absent health worker during polio campaign
--Unavailability of vaccine
--Missed opportunities to vaccinate children while at health care facility/clinic
--Immunization site too far away
--Vaccination time not convenient
--ANM (health worker) not available
--Children did not have vaccination card
--Parents facing obstacles linked to low vaccine uptake
--Mother not receiving prenatal care in rural area for a male child only
--For girls, if community does not have high availability of clinics and good roads
--Children residing in slum areas with poor health infrastructure
--Vaccinator is absent
--Missed opportunities

Communication and Information:
--"Ignorance of mothers", not receiving or understanding health messages
--Health workers do not emphasize importance of vaccinating for measles after 9 months of age (missed opportunity)
--Limited media exposure linked to lower vaccine uptake
--Lack of trust in the provider
--Few or no household visits for health care worker linked to low vaccine uptake
--Residing in rural area
--Residing in northern state (where other health and social indicators are the lowest in the country)
--Low exposure to media (TV, News, Radio)
--Lack of access to electronic media (radio or TV) linked to low vaccine uptake
--Poor rapport between immunization program and community
--No community involvement of immunization program
--Low community awareness regarding EPI

Family Characteristics:
--Having an illiterate mother linked to children not being vaccinated and being only partially vaccinated
--Poverty linked to low vaccine uptake
--Illiterate mother and father linked to low vaccine uptake
--Having an illiterate mother linked to low vaccine uptake
--Having many older siblings (born later in sibship) linked to low vaccine uptake
--Belonging to lower caste group (scheduled caste or tribe) linked to lower vaccine uptake
--Children in low socio-economic household more likely not to be vaccinated (no doses)
--Children born later with many siblings (later in sibship) more likely not to be vaccinated (no doses)
--Children living in a joint family more likely not to be vaccinated (no doses)
--Presence of same-sex older siblings linked to low vaccine uptake (especially for girls)
--Illiterate mothers linked to low vaccine uptake
--Belonging to poor urban family linked to being unvaccinated
--Poor household wealth linked to low vaccine uptake
--No or low maternal education linked to low vaccine uptake
--Belonging to a 'scheduled' tribe linked to low vaccine uptake
--No or low paternal education linked to low vaccine uptake
--Illiterate caregivers linked to low vaccine uptake
--In rural area, mother working outside of home linked to low vaccine uptake
--Birth order, being born later among a large sibship
--Having an illiterate mother linked to children not being vaccinated and being only partially vaccinated
--Low literacy level of parents, especially mothers linked to low vaccine uptake
--Illiterate mothers linked to low vaccine uptake
--Poor family linked to low vaccine uptake
--Illiterate mothers linked to low vaccine uptake
--Belonging to lower caste linked to low vaccine uptake
--Being born later in the sibship linked to low vaccine uptake
--Low maternal education level linked to low vaccine uptake
--Lower parental education linked to lower immunization coverage
--Belonging to lower castes
--Being a member of a household with a low standard of living linked to lower vaccine uptake
--Being born later in the sibship linked to lower vaccine uptake
--Living in rural area linked to lower coverage
--Child was sick
--Child returned to native village
--Domestic problems
--Low maternal education level linked to low vaccine uptake
--Poverty linked to low vaccine uptake
--Less than middle school education of mother linked to low vaccine uptake
--Belonging to certain castes linked to low vaccine uptake (minimal)
--Lower paternal education level linked to low vaccine uptake
--Illiterate parents linked to low vaccine uptake
--Belonging to a low caste linked to low vaccine uptake
--Illiterate mothers linked to low vaccine uptake
--Belonging to a lower caste/tribe linked to low vaccine uptake
--Children of illiterate mothers linked to low vaccine uptake
--Low level of mother's education
--Children of migrants less likely to be vaccinated
--Belonging to a lower caste linked to low vaccine uptake
--Literacy rates among parents
--Low household wealth linked to low vaccine uptake
--Large family size and large number of children under 5 years of age
--Low literacy among caregivers linked to low vaccine uptake
--Low socio-economic status linked to low vaccine uptake
--Low maternal literacy/female education
--Low level of mother's education
--Being in the lowest two wealth quartiles (poverty) linked to not being completely vaccinated

**Parental Attitude and Knowledge:**
--Mother is ignorant or not aware or has misconception regarding vaccinations
--Poor understanding/knowledge among health workers
--Increasing community fatigue regarding immunization (after so many polio campaigns)
--Limited maternal awareness/understanding of routine vaccinations
--Being Female linked to not being vaccinated
--Mothers belief that immunization was not beneficial
--Being female linked to not being immunized or being only partially vaccinated
--Low knowledge or awareness level regarding need/importance of vaccinations
--Mothers' lack of awareness regarding vaccinations
--Mother prefers to receive vaccinations from private provider (compared to public clinic)
--Muslim children less likely than Hindu children not to be fully vaccinated
--Children in Muslim households more likely not to be vaccinated (no doses)
--Belonging to a Muslim family linked to low vaccine uptake
--Lack of awareness among parents regarding schedule/timing of vaccinations
--Female gender of child linked to low vaccine uptake
--Social norms (related to household dynamics) linked to low vaccine uptake
--Mothers refuse to return for vaccination services in turned away the first time
--Parents lack information regarding availability of the measles vaccine
--Parents lack knowledge regarding vaccination schedule (timing for each vaccination)
--Parents' refusal to vaccinate due to belief that it is better to get the disease
--Female gender linked to low vaccine uptake
--Child is female
--Being Female linked to not being vaccinated
--Mothers belief that immunization was not beneficial
--Being female linked to not being immunized or being only partially vaccinated
--Low knowledge or awareness level regarding need/importance of vaccinations
--Lack of mothers' knowledge regarding HBV vaccine
--Parents lack sufficient information regarding vaccinations
--Lack of motivation among parents to get children vaccinated
--Being Muslim linked to low vaccine uptake
--Being female linked to low vaccine uptake
--Being a female child linked to lower vaccine uptake
--Lack of awareness among caregivers regarding need for vaccinations
--Caregivers fear side effects
--Caregivers did not observe disease in unimmunized children
--Parents observed adverse events in previous vaccinations
--Lack of knowledge about immunizations among caregivers
--Parents have low level of knowledge regarding usefulness of vaccinations in preventing illness, even after outbreak
--Girls less likely to be vaccinated (or more likely to be completely unvaccinated) especially in northern states, and in rural areas
--Lack of knowledge among poor in rural areas regarding benefits of immunization
--Lack of information among poor in rural areas as to where and when immunizations are offered
--Being Muslim linked to low vaccine uptake
--Lack of knowledge among parents regarding need for vaccinations
--Lack of knowledge among parents regarding place and time for vaccinations
--Lack of motivation among parents (no faith in immunizations, inconvenient)
--Fear of immunizations
--Child illness
--Lack of parental motivation to get children vaccinated
--Parents lack information regarding vaccinations
--Lack of family information regarding immunizations
--Lack of motivation among caregivers to take children to get vaccinations
--Mother is too busy to take children to get vaccinated
--Child was ill, and did not get vaccinations
--Lack of parents’ knowledge regarding immunizations (health education intervention increased vaccine uptake)
--Female gender linked to lower vaccine coverage
--Mother is busy
--Place and time of immunization not known
--Unaware of need to return for subsequent doses
--Being female linked to low vaccine uptake
--Religious affiliations
--Adverse events following immunizations
--Mother reported adverse reaction following previous vaccination
--Lack of awareness among parents regarding vaccinations
--Sickness prevented seeking or being vaccinated
--Being female
--Lack of motivation due to no faith in immunizations
--Lack of motivation due to fear of adverse effects and other misconceptions
--Lack of information regarding benefits of immunizations
--Lack of information regarding place of immunizations
--Child not well at time of vaccination
--Female child and other vulnerable children
--Lack of information
--Parents have misconceptions and beliefs about immunizations
--Having too many doses linked to low vaccine uptake
--Community elders believe that vaccinations are not needed
--Child had illness at the scheduled time
--Mother's lack information about immunization program
--Caregivers are lazy, forgot
--Child is female
--Mother is from household with a Muslim head of a specific caste/tribe
--Girls at higher birth orders and with older sisters are at greater risk of missing antigens compared to male siblings
--Girls receive less access to immunization than boys
--In three northern states, girls are the least likely to be vaccinated compared to boys
--Parent apathy linked to low vaccine uptake
--Lack of community motivation
--Parents not aware of the need for immunizations
--Ignorance about where immunization services are located in area
--Lack of information or parents are unaware of need for vaccinations (or need for multiple doses)
--Lack of motivation among caregivers (too busy, or vaccinations are inconvenient)
--Illness of mother or child or other family problems
--Parents fear potential side effects
Indonesia

Total population: 240,271,522
Population < 5 years of age: 22,293,426
Estimated Routine Coverage (2006 DPT3): 64% (95% CI 38% - 84%)
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
Limited access as well as low health worker knowledge level and limited involvement of community in immunization programs

Immunization Systems:
--Vaccination site too far
--Living in a rural area

Communication and Information:
--Limited knowledge/skills/community involvement of health care worker linked to low vaccine uptake (training program increased the follow-up of no shows, and working with village volunteers)

Family Characteristics:
--Higher levels of mother's education strongly associated with protective childhood behaviors including vaccination

Parental Attitudes and Knowledge:
--Parents fear side effects (e.g. vaccine makes child sick)
--Parents did not know that they had to vaccinate their children (lack of knowledge)
--Mother too busy or forgot
Iraq

Total population: 28,945,569
Population < 5 years of age: 4,068,460
Estimated Routine Coverage (2006 DPT3): 61% (95% CI 48% - 73%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Lack of vaccines at primary health centers
--Distance to clinics, especially in rural areas
--Residing in a rural environment

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Inadequate health education for mothers (ignorance and negligence)
Jamaica, Trinidad, Tobago

Total population:
   Jamaica: 2,825,928
   Trinidad, Tobago: 1,229,953

Population < 5 years of age:
   Jamaica: 278,327
   Trinidad, Tobago: 82,553

Estimated Routine Coverage (2006 DPT3):
   Jamaica: 79% (95% CI 63% - 90%)
   Trinidad, Tobago: 82% (95% CI 58% - 95%)

Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
Children living in large, extended families with limited income most likely not to be fully vaccinated

Immunization Systems:
--None identified

Communication and Information:
--None identified

Family Characteristics:
--Being a member of a poor household
--Belonging to a single parent household
--Having a high number of siblings in households
--Birth order impacts vaccine uptake
--Cohabiting households with limited income (in Jamaica)
--Lack of support from extended family support

Parental Attitude and Knowledge:
--None identified
Kazakhstan and Uzbekistan

Total population:
   Kazakhstan: 15,399,437
   Uzbekistan: 27,606,007

Population < 5 years of age:
   Kazakhstan: 1,184,413
   Uzbekistan: 2,400,868

Estimated Routine Coverage (2006 DPT3):
   Kazakhstan: 91% (95% CI 85% - 95%)
   Uzbekistan: 93% (95% CI 88% - 96%)

Number of relevant articles: 2

Summary of reasons/factors linked to unvaccinated children:
Limited access to health services and concerns regarding vaccination safety linked to low vaccine uptake

Immunization Systems:
--Living in urban area, such as Almaty, was linked to low vaccine uptake
--Only visit to doctor because of sickness in past 12 months associated with lower vaccine uptake (proxy for access to medical care)
--Children without vaccination cards were at higher risk of not being vaccinated.

Communication and Information:
--Concerns regarding competence of health care workers

Family Characteristics:
--Children of unmarried mothers were more likely to be under vaccinated

Parental Attitude and Knowledge:
--Concerns linked to adverse events linked to low vaccine coverage
--Gaps in knowledge regarding immunizations linked to low vaccine uptake
--Muslim religion was linked to low vaccine uptake
--Concerns regarding vaccine quality
Kenya

Total population: 39,002,772
Population < 5 years of age: 6,616,901
Estimated Routine Coverage (2006 DPT3): 87% (95% CI 73% - 95%)
Number of relevant articles: 4

Summary of reasons/factors linked to unvaccinated children:
Weak immunization program, including missed opportunities and inadequate vaccine supply

Immunization Systems:
--Cost of immunizations linked to low vaccine uptake
--Inconvenient clinic schedule
--Increased distance from vaccination clinics linked to low vaccine uptake
--Seasonal rainfall patterns, due to need to plant crops
--Increase cost of public transport fares which occurred in relation to rainfall patterns
--Missed opportunities due to vaccines are out of stock
--Vaccine schedule at clinic (not given on certain days)
--Syringes out of stock
--Vaccination card was lost
--Lack of finances to get vaccinations
--Child was sick or under weight
--Children were sick at time of vaccination
--Lack of finances to get vaccinations

Communication and Information:
--None identified

Family Characteristics:
--Older mothers less likely to have their children completely vaccinated compared to younger mothers
--Low education level of mothers linked to low vaccine uptake
--Unmarried mothers less likely to have children completely vaccinated
--Children in large families with more siblings less likely to be fully Vaccinated
--Low level of education of mother
--Parents of with large families less likely to vaccinate their children
Parental Attitude and Knowledge:
--Very low (or very high) knowledge level regarding immunizations linked to low vaccine uptake
--Negligence and/or ignorance among caregivers regarding children's vaccinations linked to low uptake
--Caregivers too 'busy' to take children to get vaccinations
--Parental belief that it is wrong to vaccinate child when child is sick
--Lack of motivation of parents
--Lack of knowledge of disease
Malawi

Total population: 15,028,757
Population < 5 years of age: 2,635,309
Estimated Routine Coverage (2006 DPT3): 86% (95% CI 79% - 91%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
Limited access to health and/or immunization services due to low education and socio-economic status, missed opportunities to vaccinate children born at home

Immunization Systems:
--Residing in areas with no mobile < 5 clinic
--Children born at traditional birth attendant camp linked to low vaccine uptake
--Living further from the nearest health clinic serving under 5 children
--Being born at home
--Being born between April and June

Communication and Information:
--None identified

Family Characteristics:
--Poorer housing standard and poorer socio-economic status
--Lower mother's education linked to low vaccine uptake

Parental Attitude and Knowledge:
--None identified
Malaysia

Total population: 25,715,819
Population < 5 years of age: 2,747,812
Estimated Routine Coverage (2006 DPT3): 87% (95% CI 49%– 98%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Missed opportunity - children with history of previous hospitalization less likely to be fully vaccinated

Communication and Information:
--None identified

Family Characteristics:

Parental Attitude and Knowledge:
--Incorrect/lack of knowledge among caregivers regarding vaccination schedule
Mali

Total population: 13,443,225
Population < 5 years of age: 2,513,923
Estimated Routine Coverage (2006 DPT3): 70% (95% CI 58%– 81%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Low skill and knowledge level among health workers linked to low coverage

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--None identified
Mexico

**Total population:** 111,211,789  
**Population < 5 years of age:** 10,726,608  
**Estimated Routine Coverage (2006 DPT3):** 81% (95% CI 59% - 93%)  
**Number of relevant articles:** 2

**Summary of reasons/factors linked to unvaccinated children:**  
Parents not motivated to seek EPI vaccinations and report poor customer service during previous interactions with health system

**Immunization Systems:**  
--Health centers only offered part of services advertised during mass campaigns

**Communication and Information:**  
--Poor 'beside manner' on part of personnel giving vaccinations  
--Poor customer service upon arrival at health center  
--Limited exposure to media (radio and television) linked to lower vaccine uptake

**Family Characteristics:**  
--Lower socio-economic status linked to vaccination coverage

**Parental Attitude and Knowledge:**  
--Pain associated with vaccination turns parents away  
--Limited information about immunization campaign  
--Low parental demand for services linked to low vaccine uptake
Mongolia

Total population: 3,041,142
Population < 5 years of age: 293,202
Estimated Routine Coverage (2006 DPT3): 89% (95% CI 79% - 96%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Living outside of metropolitan area

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitudes and Knowledge:
--None identified
Mozambique

Total population: 21,669,278
Population < 5 years of age: 3,502,534
Estimated Routine Coverage (2006 DPT3): 79% (95% CI 59% - 92%)
Number of relevant articles: 2

Summary of reasons/factors linked to unvaccinated children:
Weak immunization program, lack of knowledge among health care workers as well as distance to health clinic (families must seek transportation to obtain vaccinations), misconceptions about vaccination among caregivers

Immunization Systems:
--Location of home (living outside of the village less likely be vaccinated)
--Greater distance to health clinic
--Needing transportation to the clinic decreases likelihood of being vaccinated
--Home delivery linked to lower vaccine uptake
--Health care worker only sees vaccination target, not a health tool to protect children
--Health care workers do not understand benefits about vaccination
--Poor knowledge of immunization concepts by district directors
--Lack of outreach/health facilities

Communication and Information:
--None identified

Family Characteristics:
--Mother's education level (low level of education linked to low vaccine uptake)
--Children born in another country linked to lower vaccine uptake

Parental Attitude and Knowledge:
--Mother's lack of information on EPI linked to low vaccine uptake
--Mother's lack of belief in immunizations linked to low vaccine uptake
--Problematic assumptions about vaccinations
Nepal

Total population: 28,563,377
Population < 5 years of age: 3,246,265
Estimated Routine Coverage (2006 DPT3): 88% (95% CI 81% - 93%)
Number of relevant articles: 4

Summary of reasons/factors linked to unvaccinated children:
Access to immunization services due to distance or missed opportunities (no vaccination card) linked to low vaccine uptake

Immunization Systems:
--Not having vaccination card related to high default rate
--Low quality health post (immunization services)
--Access to health post
--Minimal outreach activity
--Not having a vaccination card linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Lower education level of caregivers linked to low vaccine uptake
--Children of parents employed as laborers less likely to be vaccinated

Parental Attitude and Knowledge:
--None identified
Nicaragua

Total population: 5,891,199
Population < 5 years of age: 662,703
Estimated Routine Coverage (2006 DPT3): 84% (95% CI 67%– 95%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Urban living

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Low institutional trust
Nigeria

Total population: 149,229,090
Population < 5 years of age: 23,399,207
Estimated Routine Coverage (2006 DPT3): 55% (95% CI 43% - 67%)
Number of relevant articles: 9

Summary of reasons/factors linked to unvaccinated children:
Weak immunization program, inadequate knowledge of health workers, missed opportunities (not having vaccination card), and limited access among children living in remote rural areas (distance to services). Poor communication to community and lack of understanding of disease risk/vaccination benefits among caregivers, role of anti-vaccination promotion among religious groups, lack of trust in health system

Immunization Systems:
--Vaccines were not available
--Inadequate vaccine supply, especially at birth
--Missed opportunities to vaccinate
--Children not having vaccination cards were less likely to be fully vaccinated
--Poor attitude among health care workers
--Difficulty in training health care workers, low knowledge level
--No antenatal care reduces the likelihood of receiving BCG vaccine
--Place of birth, being born at home instead of clinic reduces likelihood of receiving BCG vaccine
--Not having a vaccination card reduces likelihood of receiving BCG vaccine
--Irregular supply of BCG vaccine linked to lower coverage
--Living in remote conditions linked to low vaccine uptake (in geographically hard to reach areas)
--Inconsistent supply of vaccines (cold chain, transport related)
--Poor commitment to vaccination services
--Inadequate knowledge level among health care workers regarding vaccinations
--Immunization histories not taken during clinic/hospital visits
--Lack of adequate vaccine supply
--Far distance to health facility linked to low vaccine uptake

Communication and Information:
--General distrust in health system, having to pay for drugs while immunizations were free
--Children of mothers without availability of newspapers and radio had higher risk of unvaccinated
--Lack of outreach efforts
--Mother is not exposed (lack of information) to information on child health in media or community
--No one in community to educate mothers on importance of vaccinations (lack of vaccination community workers), lack of awareness
--General distrust of the immunization program

**Family Characteristics:**
--Low literacy levels among mothers living in rural areas linked to low vaccine uptake
--Low parental education level linked to vaccine uptake
--Children with mothers and fathers with no education were more likely to be unvaccinated compared to children with mothers and fathers with more than two years of formal education
--Children of mothers in the poor and middle quartiles of wealth (poverty) were less likely to be fully vaccinated
--Rank of birth, higher the rank, lower the likelihood of receiving BCG vaccine
--Belonging to minority ethnic group (ethnic isolation)
--Low education level of mother
--Low socio-economic status of parents linked to low vaccine uptake
--Low maternal education level

**Parental Attitude and Knowledge:**
--Parents are not aware of measles vaccination
--Parents do not believe that vaccinations work
--Parents/families felt abused by while in hospital or sick
--Husband refuses permission or is not around to accompany mother to clinic
--Against vaccinations for religious reasons (illness caused by God or evil spirits)
--Limited knowledge of mother/caregiver regarding vaccinations
--In rural areas, caregivers do not understand importance of vaccinations in terms of disease prevention
--Local, religious, and traditional leaders in rural areas do not promote immunization awareness
--Immunizations viewed as dangerous or unnecessary
--Mothers reported disease in children that were vaccinated
--Belief that vaccines cause sterility
--Religious leaders communicate ill effects of vaccinations
--Vaccinations are being promoted by Western/Christian countries
--Religious beliefs that 'God' should be vaccinating/protecting children
--Limited to no focus on other serious diseases (attention only on polio)
--Children of Muslim mothers were more likely not to be vaccinated compared to Christian mothers
--Children of mothers with autonomy were more likely to be unvaccinated
--Mother not knowing timing or routine immunization visits (knowledge)
--Mother does not have someone to assist with taking child for vaccination (no time or resources)
--Father does not approve of immunization linked to low uptake of BCG vaccine
--Low awareness/misconceptions regarding vaccinations
--Limited maternal knowledge of immunizations
--Low knowledge level among parents regarding vaccinations
--Child was ill and not vaccinated
--Reported illness following previous vaccination (fear of adverse events)
--Political leaders arguing that OPV is not safe (could cause HIV, Cancer, and infertility)
Pakistan

Total population: 174,578,558
Population < 5 years of age: 21,270,828
Estimated Routine Coverage (2006 DPT3): 58% (95% CI 51% - 65%)
Number of relevant articles: 12

Summary of reasons/factors linked to unvaccinated children:
Access to health/immunization services due to distance, primarily among children living in remote rural communities, limited knowledge regarding risk of disease/benefits of immunization among rural poor, infrequent family discussions regarding immunizations (role of mothers participation in discussions), fear and misconceptions concerning vaccinations

Immunization Systems:
--Mothers not receiving TT vaccination linked to low vaccine uptake among children
--Distance to facility (greater distance) linked to low vaccine uptake
--Absence of mobile teams linked to low vaccine uptake
--Inadequate vaccine supply at health clinics
--Children not vaccinated due to illness or weakness
--Physicians do not provide advice on vaccinations
--Many physicians consider vaccine has limited effectiveness and/or side effects
--Physicians have poor knowledge regarding immunizations
--Limited supply of syringe stock
--Limited health care worker training and knowledge
--Clinics or vaccination posts are too far away
--Limited mobility of vaccinators to reach remote (hard to reach) areas linked to low coverage
--No incentives for vaccinators linked to low coverage
--Pediatricians do not refer children for immunizations nor welcome EPI activity at sites
--Lack of involvement of private sector linked to low coverage
--Inadequate use of lady health workers (village health workers) in vaccination activity linked to low coverage linked to low coverage
--Limited power of district health officer to deal with absent vaccinators
--Poor design of vaccination card linked to low vaccine uptake
--Lack of center based education linked to low vaccine uptake
--Costs, financial and time (poverty) limited vaccination uptake
--Access to services limited vaccination uptake
--Living in rural area was risk for low vaccine uptake
--In rural areas, marginalized homes (distance) linked to low vaccine uptake
--Knowledge gap among health care workers
--Lower immunization uptake in rural areas
--In rural areas, greater distance to health facility related to lower coverage
--In rural areas, lack of immunization teams visiting community related to lower coverage
--Poor service quality, vaccinator absent, etc.
--Lack of vaccine at clinic

**Communication and Information:**
--Not owning a TV set was linked to low vaccine uptake
--Lack of visits by health care professionals discussing immunizations related to lower coverage

**Family Characteristics:**
--Illiterate father or mother or both parents linked to low vaccine uptake
--Low socio-economic status, housing type, linked to low vaccine uptake
--In rural areas, low SES (job type, roof type linked to low vaccine uptake)
--In urban areas, low maternal education linked to low vaccine uptake
--In rural areas, lower SES related to lower coverage
--Mothers with no formal education related to lower coverage
--Poverty

**Parental Attitude and Knowledge:**
--Parents lack information on need for as well as on location and place of immunizations
--Parents fear side effects
--Parents do not have any faith in vaccinations vaccinated
--Ill child or mother
--Mother lacks motivation (mother too busy)
--Caregivers have limited or incorrect knowledge regarding vaccination schedule
--Parents see vaccinations as unnecessary
--Parental belief that vaccines will make children sick
--Parents are too busy to take children to get vaccinated
--Parents are uninformed about immunizations
--Parents believe that vaccinations are not important
--Parents fear adverse reaction
--Limited knowledge about health care and immunizations linked to low vaccine uptake
Limited information on prevalence of measles and complications associated with measles linked to low coverage
Limited family discussions of vaccinations linked to low coverage
Limited information/knowledge about the importance of vaccination
Limited information on cost of vaccination in relation to treating case of measles
Misconceptions about vaccinations limited vaccination uptake
Lack of family discussion of vaccination limited vaccination uptake
Mothers unable to identify (knowledge) vaccine preventable disease related to lower coverage
In urban areas, mothers aware of bad effects of immunization related to lower coverage
In rural areas, mothers unaware of bad effect of immunization related to lower coverage
Lack of family discussions regarding immunization related to lower coverage
Lack of mother's participation in family discussions of immunization related to lower coverage
Parents do not understand risk, negative or fatalistic attitudes regarding immunizations
Parents think that vaccinations are painful and fear side effects
Limited mobility of women
Papua New Guinea

Total population: 5,940,775
Population < 5 years of age: 775,745
Estimated Routine Coverage (2006 DPT3): 61% (95% CI 30% - 87%)
Number of relevant articles: 2

Summary of reasons/factors linked to unvaccinated children:
Lack of access to immunization due to distance and security, lack of outreach services, limited motivation among caregivers (have other activities/responsibilities) linked to low vaccine uptake

Immunization Systems:
--Caregiver was sent away and asked to return the next day
--Irregular access to clinic
--Far distance to clinic
--Waiting too long at clinic
--Lack of money for transportation to clinic
--There is insecurity in area
--Lack of resources to repair of transport and good outreach sites (service outreach limited) linked to low vaccine uptake
--Poor security, many tribal battles ongoing linked to low vaccine uptake
--Lack of transport and/or staff linked to low vaccine uptake
--Lack of supervision linked to low vaccine uptake

Communication and Information:
--Health worker is not nice to parent
--Inadequate community involvement linked to low vaccine uptake

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Death of relative in village (time) keeps parents from taking child to clinic
--Parent not well informed about vaccine side effects
--Father does not consent to vaccination
--Household chores keep mother busy
--Too many injections are given
Philippines

Total population:
Population < 5 years of age:
Estimated Routine Coverage (2006 DPT3):
Number of relevant articles: 2

Summary of reasons/factors linked to unvaccinated children:
Living in rural areas, belonging to certain ethnic groups, being part of a large family linked to low vaccine uptake

Immunization Systems:
--Living in a rural area linked to low vaccine uptake
--Residing in a rural community associated with low coverage
--Not attending all antenatal visits linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--Certain ethnicities less likely to be fully vaccinated
--Low education level of parents linked to low vaccine uptake
--Lower socio-economic status linked to low vaccine uptake
--Having a number of children less than 5 years of age in household
--Born later in the sibship linked to low vaccine uptake

Parental Attitude and Knowledge:
--None identified
Sierra Leone

Total population: 5,132,138
Population < 5 years of age: 854,920
Estimated Routine Coverage (2006 DPT3): 75% (95% CI 59%– 87%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Children born during the war having lower vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--Mother too busy to take children to get vaccinated (postponed until mother has time)
--Fear of side effects linked to low vaccine uptake
South Africa

Total population: 49,052,489
Population < 5 years of age: 4,700,346
Estimated Routine Coverage (2006 DPT3): 91% (95% CI 76% - 98%)
Number of relevant articles: 4

Summary of reasons/factors linked to unvaccinated children:
Clinic factors (missed opportunities, incorrect information, and distance) linked to low vaccine uptake

Immunization Systems:
--Parents can not afford transport to the clinic
--Clinic is too far from home
--Stock-out of vaccines at the clinic
--Mother is pregnant and unable to walk child to clinic
--Elderly caretaker also unable to walk to clinic
--Many obstacles to immunization
--Lack of adequate vaccine supply linked to low coverage
--Place of immunization too far aware
--Obstacle to immunization - child illness
--Concerns that measles campaign diverts resources away form routine measles program and results in lower coverage
--Clinic factors, reported missed opportunities, told to return another time
--Clinic factors, provided incorrect vaccination dates (communication)
--Clinic factors, immunizations provided at inconvenient times
--Clinic is too far away for some families
--Clinic factors, vaccines not being available
--Lack of information given by health workers, incorrect ideas about contraindications
--Lack of information given by health workers regarding need for repeat doses
--Caregiver being unable able to attend clinic
--Children not having a vaccination card more likely to have low vaccine uptake

Communication and Information:
--Rude of unhelpful nurses and/or clinic staff

Family Characteristics:
None identified

Parental Attitude and Knowledge:
--No one is available to take the child to the clinic
--No one at home to look after the other children
--Parents lack information needed to get their children vaccinated
--Parents lack motivation to get their children vaccinated
--Caregiver not being in home area when child vaccine is due and not knowing that mother can take child to another clinic
Swaziland

**Total population:** 1,337,186  
**Population < 5 years of age:** 179,166  
**Estimated Routine Coverage (2006 DPT3):** 91% (95% CI 86 – 95%)  
**Number of relevant articles:** 1

**Summary of reasons/factors linked to unvaccinated children:**  
Missed opportunities, including not having a vaccination card, and vaccine supply linked to low vaccination coverage

**Immunization Systems:**  
--Children without health card resulted in missed opportunities  
--Limited availability of vaccines  
--Facilities not providing integrated services  
--Type of clinic linked to missed opportunities

**Communication and Information:**  
--None identified

**Family Characteristics:**  
--None identified

**Parental Attitude and Knowledge:**  
--None identified
Tanzania

Total population: 41,048,532
Population < 5 years of age: 6,388,230
Estimated Routine Coverage (DPT3): NA
Number of relevant articles: 3

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Greater distance to health clinic linked to low vaccine uptake
--Limited time spent on preventive services such as immunization in health facilities

Communication and Information:
--None identified

Family Characteristics:
--Low socio-economic status is linked to low vaccine uptake
--Low socio-economic status linked to low vaccine uptake

Parental Attitude and Knowledge:
--None identified
Thailand

Total population: 65,998,436
Population < 5 years of age: 4,374,097
Estimated Routine Coverage (2006 DPT3): 97% (95% CI 93% - 99%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--Residing in rural area linked to low vaccine uptake

Communication and Information:
--None identified

Family Characteristics:
--None identified

Parental Attitude and Knowledge:
--None identified
Turkey

Total population: 76,805,524
Population < 5 years of age: 7,023,630
Estimated Routine Coverage (2006 DPT3): 74% (95% CI 53% - 89%)
Number of relevant articles: 14

Summary of reasons/factors linked to unvaccinated children:
Density/availability and experience/knowledge level of health care workers linked to vaccine uptake, access to immunization services including travel distance and living in remote communities as well as low educational level of caregivers associated with low vaccination coverage

Immunization Systems:
--Children of families living in sub-urban areas have lower coverage compared to children in urban areas
--Child was sick and therefore not vaccinated
--Low health worker density linked to low vaccine uptake
--Residing in a rural location linked to low vaccine uptake
--Type of health worker density linked to low vaccine uptake
--Living in a settlement area linked to low vaccine uptake
--Living in a rural area linked to low vaccine uptake (but better than in settlement areas)
--Low knowledge/training level of health care workers linked to low vaccine uptake
--Years of work experience impacts vaccination coverage
--Missed opportunities (health care worker did not want to open new vial)
--Economic reasons
--Limited follow-up visit of midwives
--Living in rural area
--Wrong contraindications
--Lack of money for transportation
--Lack of training/knowledge of health care workers (training increased vaccination coverage)
--Low health care staff density associated with low coverage (different categories of health staff have different influence on coverage)
--Missed opportunities (health care worker did not want to open new vial)
--Economic reasons

Communication and Information:
--Gender of health worker impacts vaccination coverage
--Lack of effective communication between health staff and mothers

**Family Characteristics:**
--Families with fewer than 2 kids had lower rates of being fully vaccinated
--Low socio-economic status
--Large number of siblings
--Low literacy level of mothers linked to low vaccine uptake
--Illiterate mothers linked to low vaccine uptake
--Low level of maternal education (but no link to father's education level)
--Immigration
--Education level of mother
--Migration from one area to another (from rural to semi-urban areas)
--More siblings in the family linked to low vaccine uptake
--Socio-economic status of the family
--Birth interval
--Lower education level of parents linked to low vaccine uptake
--Illiterate mothers more likely to have unvaccinated or partially vaccinated children
--Illiterate fathers more likely to have unvaccinated or partially vaccinated children
--Lower socio-economic status linked to low vaccine uptake
--Large sibship linked to low vaccine uptake
--Immigration

**Parental Attitude and Knowledge:**
--Lack of parental knowledge regarding importance and timing of vaccinations
--Poor knowledge among parents regarding reasons to vaccinate
--Parents confused on timing/schedule for vaccinations (due to different schedules used by private vs. public providers)
--False beliefs among parents regarding vaccination linked to low vaccine uptake
--Parents have fear about potential side effects of vaccines
--Being in a village and having no knowledge of vaccination
--The father did not allow vaccination
--Illness of child and misinformation about side effects of vaccines
--Immunizations not perceived as important
--Gender roles
--Being in a village and having no knowledge of vaccination
--The father did not allow vaccination
--Illness of child and misinformation about side effects of vaccines
Uganda

**Total population:** 32,369,558
**Population < 5 years of age:** 6,545,273
**Estimated Routine Coverage (2006 DPT3):** 66% (95% CI 53% - 77%)
**Number of relevant articles:** 6

**Summary of reasons/factors linked to unvaccinated children:**
Access to immunization services and missed opportunities (due to low knowledge level of health workers and not having vaccination card), many misconceptions and limited understanding of vaccinations among caregivers linked to low vaccine uptake

**Immunization Systems:**
-- Gaps in service delivery
-- Not having a vaccination card linked to low vaccine uptake
-- Poor access and quality of services
-- High staff turnover
-- Multi-dose schedules difficult to complete compared to single dose
-- Children were refused vaccinations by health worker due to illness (contraindication)
-- Missing child health card linked to low vaccine uptake
-- Being born at home linked to low vaccine uptake
-- Lack of knowledge regarding immunizations among health care workers
-- HIV status of mother (being infected linked to lower vaccine uptake)
-- Access to immunizations (to location where vaccinations are given)
-- Few or no antenatal visits linked to lower vaccine uptake among children

**Communication and Information:**
-- Parents have poor access to information regarding immunizations
-- Caregivers are uncomfortable with health care workers

**Family Characteristics:**
-- Born later in the sibship (having a large number of older brothers/sisters)
-- Mother's education level

**Parental Attitude and Knowledge:**
-- Caregiver belief that vaccines are dangerous (laced with HIV)
-- Illness of caregiver linked to low vaccine uptake
-- Low motivation of caregiver, lack of concern for child
--Unconvinced of need for immunizations due to traditional beliefs and practices
--Lack of knowledge regarding immunizations among parents
--Limited maternal knowledge about immunizations
--Negative maternal beliefs about immunizations
Vietnam

**Total population:** 88,576,758  
**Population < 5 years of age:** 7,773,616  
**Estimated Routine Coverage (2006 DPT3):** 82% (95% CI 72% - 89%)  
**Number of relevant articles:** 3

**Summary of reasons/factors linked to unvaccinated children:**
Lack of access (living in rural area) to immunization services and maternal health care services as well as low maternal education level and belonging to minority group linked to low vaccine uptake

**Immunization Systems:**
--Residing in a poor, rural area linked to low vaccine uptake  
--Lack of community health center in area (geographic isolation)  
--Living in a rural area  
--Low availability of community health centers  
--Location of vaccine storage site  
--Limited pregnancy tracking in community  
--Location and relation to rural or urban hospital  
--Poor interpretation of contraindications for Hep B birth dose  
--Limited access to maternal services

**Communication and Information:**
--Mother not watching TV on regular basis  
--Minimal access to television (media)

**Family Characteristics:**
--Low literacy and education levels of mother linked to low vaccine uptake  
--Low SES linked to low vaccine uptake  
--Belonging to a minority group linked to low vaccine uptake  
--Low literacy level of mothers linked to low vaccine uptake  
--Low socio-economic status  
--Being a minority

**Parental Attitude and Knowledge:**
--Family perceptions of benefits of birth dose  
--Traditional practices of keeping newborns at home
Zambia

Total population: 11,048,532
Population < 5 years of age: 2,005,423
Estimated Routine Coverage (2006 DPT3): 90% (95% CI 78% - 97%)
Number of relevant articles: 1

Summary of reasons/factors linked to unvaccinated children:
See below

Immunization Systems:
--HIV infected children unlikely to be vaccinated

Communication and Information:
--None identified

Family Characteristics:
--Low maternal education level linked to low vaccine uptake
--Large family size linked to low vaccine uptake

Parental Attitude and Knowledge:
--None identified
General: Regional/Global

Number of relevant articles: 9

Summary of reasons/factors linked to unvaccinated children:
Weak immunization programs, low concentration of skilled health care workers, environmental barriers (distance, civil conflict), and poor understanding and many misconceptions (fears) about vaccinations

Immunization Systems:
--Residing in rural area linked to low vaccine uptake
--Limited or no incentives to vaccinate children linked to low coverage
--Low concentration of doctors per 1000 population linked to low measles vaccine coverage
--Low concentration of all health workers per 1000 population linked to low measles vaccine coverage
--Poor management of immunization programs
--Non-robust implementation of immunization programs resulting in poor service delivery
--Lack of political pressure to improve immunization systems
--Low concentration of doctors and nurses linked to low vaccine uptake
--Low concentration of doctors alone linked to low vaccine uptake
--Parents are not using vaccination services because of poor management
--Parents are not using vaccination services because of logistical problems
--Many missed opportunities to vaccination children
--Lack of outreach facilities or vaccination posts
--Conflict linked to low vaccine uptake
--Environmental barriers to vaccination (distance is far, limited transportation, and civil conflict) linked to low vaccine uptake
--Limited vaccine supply linked to low vaccine uptake
--Missed opportunities due to scheduling linked to low vaccine uptake
--Low health worker density linked to low vaccination coverage
--Low nurse density linked to low vaccination coverage
--Poor service quality (management, funding, and delivery)

Communication and Information:
--Poor media communication schemes linked to low vaccine coverage
--Lack of social mobilization linked to low coverage
--Poor communication exchange between provider and parents

**Family Characteristics:**
--Illiterate mothers linked to low vaccine uptake
--Children in low SES households less likely to be fully vaccinated compared to higher SES households
--Low social class or low socio-economic status linked to low vaccine uptake
--Low parents’ education level linked to low vaccine uptake
--Low female literacy linked to low vaccination coverage

**Parental Attitude and Knowledge:**
--Girls less likely to be fully vaccinated compared to boys
--Low knowledge levels regarding vaccination services
--Lack of incentives for families to vaccinate their children (e.g. free-credit, etc.)
--Poor public demand for immunization services
--Parents have negative beliefs about measles and vaccination (measles is not a problem, vaccine makes children sick, not negative consequences if children do not receive vaccine)
--Mother's do no request vaccinations (only passive acceptance)
--Religious conviction - against vaccinations
--Coercive pressure or political association with campaigns
-Anti-vaccination lobby (regarding vaccine safety, etc.)
--Lack of trust or acceptance of western medical system
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<tr>
<th>Country</th>
<th>No. Articles</th>
<th>Total Immunization Reasons</th>
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* Total 200 articles (and 818 documented reasons), excludes 9 general/regional articles

* = one reason

Reason categories from Vaccines, 3rd edition