

Randomised control trials

Study name	Author (year) Country/region	Additional/duplicate references	Recruitment period	Randomisation protocol	Number BCG vaccinated/number unvaccinated
Native American ⁵	Aronson (2004) USA (South East AK, AZ, ND, SD and WY)	Additional: ^{45, 230–235} Duplicate: ^{236–238}	1935–8	Quasi-randomisation, two arms, comparator intervention: placebo	1551/1457
Turtle and Rosebud infants ⁴⁵	Aronson (1948) USA (ND and SD)	Additional: ²³⁵	1938–40	Quasi-randomisation, two arms, no comparator intervention	123/139
Illinois mentally handicapped ⁵⁰	Bettag (1964) USA (IL)	None	1947	Randomisation unclear, two arms, no comparator intervention	531/494
African gold miners ⁵⁴	Coetzee (1968) South Africa	None	1965–8	Quasi-randomisation, two arms, no comparator intervention	8317/7997
Saskatchewan infants ¹³	Ferguson (1949) Canada (SK)	None	1933–45	Randomisation unclear, two arms, no comparator intervention	306/303
Madanapalle ⁵³	Frimodt-Moller (1960) India (Madanapalle)	Additional: ^{239–241} Duplicate: ²⁴²	1950–5	Individual randomisation, two arms, no comparator intervention	5069/5803
New York infants randomised ¹²	Levine (1938) USA (NY)	Additional: ^{125, 243}	1933–9999	Quasi-randomisation, two arms, no comparator intervention	463/476
MRC ¹⁴	MRC (1956) UK (London, Birmingham, Manchester)	Additional: ^{21, 244–246} Duplicate: ^{247–249}	1950–2	Quasi-randomisation, three arms, no comparator intervention	20,800/13,300
Agra ⁵¹	Mehrotra (1988) India (Agra)	None	9999–9999	Randomisation unclear, two arms, no comparator intervention	1259/1259
Bombay infants ⁵²	Mehta (1976) India (Mumbai)	None	9999–9999	Randomisation unclear, two arms, no comparator intervention	396/300
Georgia/ Alabama ¹⁵	Palmer (1958) USA (Muscogee county, GA and Russell county, AL)	Additional: ^{31, 250, 251} Duplicate: ²⁵²	1950	Quasi-randomisation, two arms, no comparator intervention	16,913/17,854
Puerto Rico children ¹⁵	Palmer (1958) USA Minor Outlying Islands (Puerto Rico)	Additional: ²⁵¹	1949–51	Quasi-randomisation, two arms, no comparator intervention	50,634/27,338
Chicago nurses ⁴⁷	Rosenthal (1963) USA (Chicago, IL)	Additional: ^{44, 253, 254}	1940–52	Quasi-randomisation, two arms, comparator intervention: placebo (saline)	231/263

Source of participants (gender)	Inclusion criteria/tuberculin testing	BCG vaccination administration type, strain and reason	Age at BCG vaccination	BCG vaccination ascertainment
Native American and Alaskan natives (both genders)	Normal chest radiographs; PPD negative at 0.00002 and 0.005 mg of PPD tuberculin; living on reservations; children attending Indian Service Schools and denominational boarding schools	Intradermal injection Strain: Pasteur 317 used at US sites; 575 used at Alaskan sites, for research	0–20 years, median: 7.6 years	Research study records
Native American Infants (both genders)	Born in hospitals in Turtle Mountain and Rosebud reservation agencies	Intradermal injection Strain: not specified, for research	Neonatal (< 1 year)	Research study records
Mentally handicapped institution (Lincoln State School) (both genders)	Resident of the Lincoln school in 1947, tuberculin negative and negative chest radiograph in 1947	Percutaneous injection Strain: not specified, for research	Older children (6–11 years), teen (12–18 years), adult (> 19 years)	Medical records
Miners in one South African mine. (males only)	New miners entering a single gold mine (all men) irrespective of tuberculin reactivity	Not specified Strain: Glaxo, for research	Adult (> 19 years), median: 30 years	Research study records
Canadian Natives (both genders)	Infants born in Qu'Appelle Indian Health area	Intradermal injection Strain: Pasteur 450-S1, 468-S1, for research	0–10 days	Medical records
General population (both genders)	An induration of ≤ 4 mm if tested with 5TU	Intradermal injection Strain: Madras, for research	All ages	Research study records
Infants from tuberculous families (both genders)	All children had to come from households with tuberculosis and have no indication to tuberculosis by PPD, chest radiograph, or physical examination if older than 1 month	Subcutaneous and intradermal injection Strain: not specified, for research	0–3 years	Research study records
Secondary schools. (both genders)	Children in their penultimate term with parental consent (60%), no history of recent tuberculosis in family, negative chest radiograph, two negative tuberculin skin tests, no previous BCG vaccine	Intradermal injection Strain: Copenhagen, for research	14–15.5 years	Research study records, medical records
Children in slum in Agra (both genders)	Tuberculin negative (for vaccinated group)	Not specified Strain: not specified, for research	0–5 years	Research study records
Single hospital: well baby clinic (both genders)	Newborns in Well Baby Clinic at Bai Jerbai Wadia Hospital for children in Bombay	Intradermal injection Strain: Madras, for research	Neonatal (< 1 year)	Research study records
General population (both genders)	≥ 5 years old, residing in Muscogee or Russell counties, 5 TU PPD negative, chest radiograph negative (two independent reviewers); no obvious medical contradictions to vaccination	Intradermal injection Strain: Tice (BCG), for research	Young children (1–5 years), older children (6–11 years), teen (12–18 years), Adult (> 19 years) Range: 5–85 years	Research study records
School-aged children (both genders)	negative to first 1TU (≥ 5 years old), then 10TU. (< 6 mm)	Intradermal injection Strain: Copenhagen, RT-19–20–21, for research	1–18 years	Research study records
Student nurses (female)	Students entering nursing school at Cook County Hospital, Chicago, who were PPD negative (did not react to 2 TU, then 100 TU) and chest radiograph negative	Intradermal injection Strain: not specified, for research	Adult (> 19 years)	Research study records

Study name	Author (year) Country/region	Additional/duplicate references	Recruitment period	Randomisation protocol	Number BCG vaccinated/number unvaccinated
Chicago medical students ⁴⁶	Rosenthal (1965) USA (Chicago, IL)	None	1939–52	Randomisation unclear, two arms, comparator intervention: placebo (unspecified type)	324/298
Chicago infants TB HH (from tuberculosis households) ⁴⁸	Rosenthal (1945) USA (Chicago, IL)	Additional: ^{44,253–256}	1941–9999	Quasi-randomisation, two arms, no comparator intervention	311/250
Chicago Infants CCH (Cook County hospital) ⁴⁸	Rosenthal (1945) USA (Chicago, IL)	Additional: ^{44,253,254,257,258} Duplicate: ²⁵⁹	1937–48	Quasi-randomisation, two arms, no comparator intervention	5426/4128
Ida B Wells housing project ⁴⁴	Rosenthal (1948) USA (IL)	Additional: ^{253, 254}	1942–9999	Quasi-randomisation, two arms, comparator intervention: placebo (saline)	699/625
US mental health patients ⁴⁴	Rosenthal (1948) USA (IL)	None	1944	Quasi-randomisation, two arms, no comparator intervention	20/15
Georgia (school) ⁴⁹	Shaw (1951) USA (Muscogee County, GA)	Additional: ^{260, 261} Duplicate: ²⁵²	1947	Quasi-randomisation, two arms, no comparator intervention	2498/2341
Chingleput ²⁸	Tuberculosis Prevention Trial (TBPT) (1979) India (Chingleput)	Additional: ^{19, 221, 262, 263} Duplicate: ²⁶⁴	1968–71	Individual randomisation, five arms, comparator intervention: placebo (dextran)	73,459/36,404
Haiti ⁵⁵	Vandivière (1973) Haiti (District of Jeremie, Governmental Sector VI)	None	1965–6	Randomisation unclear, six arms, comparator intervention: placebo (small pox vaccine alone or with Isoniazid)	641/340

9999, missing.

Source of participants (gender)	Inclusion criteria/tuberculin testing	BCG vaccination administration type, strain and reason	Age at BCG vaccination	BCG vaccination ascertainment
Medical students (both genders)	None provided	Intradermal injection Strain: not specified, for research	Adult (> 19 years)	Research study records
Single hospital: Special tuberculosis obstetrics clinic. Clinic and recruited (both genders)	Newborns from tuberculosis positive mother or with tuberculosis in household, with agreement of mother to have them placed in a foster home for 6 weeks to 2 months	Intradermal injection Strain: Pasteur Tice (BCG), for research	7 days to 3 months	Research study records
Single hospital: Obstetrics ward (both genders)	Newborns to mothers delivering at Cook County Hospital (CCH) from non-tuberculosis households. Cleared tuberculosis within 3 months of the child's birth within a family allowed inclusion of the child. Normal birth weight and negative syphilis serology in the mother	Percutaneous injection Strain: Pasteur, Tice (BCG), for research	3–7 days	Research study records
Children in one community living in the Ida B Wells federal housing project (both genders)	Children 10–12 years or younger living in the housing project surveyed, tuberculin negative (for vaccinated group)	Intradermal injection Strain: Pasteur, for research	0–12 years	Research study records
Mental health patients at an unknown single institute (both genders)	Tuberculin negative	Intradermal injection Strain: Pasteur, for research	All ages	Research study records
Public and private elementary and high schools (both genders)	Schoolchildren living in Muscogee county who were negative to first 5 TU PPD and second 100 TU (negative = <5 mm)	Intradermal injection Strain: Tice (BCG)811K, 811L, 812E, 812L, 813E, for research	Young children (1–5 years), older children (6–11 years), teen (12–18 years)	Research study records
General population: 209 villages and one town (both genders)	> 1 month old and no indication of pulmonary tuberculosis	Intradermal injection Strain: Danish-1331, Pasteur-1173 P2, for research	All ages (≥ 1 month)	Research study records
General population (both genders)	TST non-reactive (< 6 mm 5TU), living in a mapped household of District of Jeremie	Intradermal injection Strain: Montreal, 1202–5, for research	0–85 years	Research study records

Case-control studies

Study name	Author (year Country/Region)	Additional/ duplicate references	Recruitment period	Number vaccinated/ unvaccinated	Source of cases/control subjects
Indonesia ⁷³	Putrali (1983) Indonesia (Jakarta)	None	1981–2	103/412	<i>Cases:</i> Multiple hospitals <i>Control subjects:</i> Multiple hospitals
Saudi Arabia ⁷⁷	Al-Kassimi (1995) Saudi Arabia	None	1991–2	537/5756	<i>Cases:</i> Survey (1991–1992) of seven tuberculosis centres in Ministry of Health hospitals <i>Control subjects:</i> General population from nationwide community survey of TU sensitivity and BCG scar
Delhi ⁵⁷	Bhattacharjee (1993) India (Delhi)	None	1989–90	21/42	<i>Cases:</i> Single hospital <i>Control subjects:</i> Neighbourhood
Madagascar children ⁷⁹	Boileau (1995) Madagascar (Antananarivo)	None	1992–4	52/122	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
Brazil ⁶⁷	Camargos (1988) Brazil (Belo Horizonte MG)	None	1975–81	45/90	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital, <i>Other control subjects:</i> Single hospital
Bangalore children ⁵⁶	Chadha (2004) India (Bangalore City)	None	9999–9999	137/176	<i>Cases:</i> Multiple hospitals <i>Control subjects:</i> Neighbourhood (four houses either side of the suspected case's house)
Thailand ⁶⁶	Chavalittamrong (1986) Thailand (Bangkok)	None	1980–4	330/1106	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital

Inclusion criteria	Matching factors	BCG vaccination administration and type	Vaccination dates	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<p><i>Cases:</i> ≥ 5 years old; BCG vaccinated in first year of life; tuberculosis diagnosed patient from eight hospitals</p> <p><i>Control subjects:</i> Non-tuberculosis patients in the same eight hospitals; ≥ 5 years old</p>	Age and sex	Assumed intradermal (BCG vaccination status assessed through scar) Strain: Pasteur, Tokyo	Not specified	Scar	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases and control subjects:</i> ≤ 34 years old</p>	Unmatched	Not specified Strain: not specified	Not specified	Scar	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> 0–5 year old residents of Delhi with documented tuberculosis meningitis cases</p> <p><i>Control subjects:</i> Never hospitalised or treated except for injuries and minor ailments</p>	Age and sex	Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Vaccination card, scar	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> Children with diagnostic proof of tuberculosis admitted to paediatric centre</p> <p><i>Control subjects:</i> Children hospitalised for pathology different to tuberculosis in same hospital from December 1994 to January 1995</p>	Age	Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Parent of participant recall, scar	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> Admitted to hospital</p> <p><i>Control subjects:</i> Admitted for acute diarrhoea (AD)</p> <p><i>Other control subjects:</i> Admitted for acute non-tuberculosis bacterial pneumonias (BP)</p>	Age at hospitalisation, date of hospitalisation and nutritional status	Intradermal injection Strain: Moreau	Not specified	Medical records	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> All children 1–14 years suspected of tuberculosis and meeting the tuberculosis case definition and living within 30 km of the city centre (Stegen and Jones (SJ) score 7 or more to qualify as a case)</p> <p><i>Control subjects:</i> SJ had to be < 4 to qualify as a control</p>	Age, sex, residence	Assumed intradermal (BCG vaccination status assessed through scar) Strain: Danish 1331	Not specified	Scar	Neonatal/childhood	1–14 years	Both
<p><i>Control subjects:</i> Tuberculin negative</p>	Unmatched	Intradermal injection Strain: Pasteur (Mérieux)	Not specified	Parent of participant recall, scar	Neonatal/childhood	Infant (< 1 year)	Both

Study name	Author (year Country/Region)	Additional/duplicate references	Recruitment period	Number vaccinated/unvaccinated	Source of cases/control subjects
Canada 1975 ⁶³	Houston (1990) Canada (AB)	None	1975–9	132/232	<i>Cases:</i> Aboriginal Canadians surveillance <i>Control subjects:</i> Aboriginal Canadians listed on the Treaty Indian Register in the Medical Services of Alberta Province
Lucknow paediatric ⁶¹	Kumar (2005) India (Lucknow)	None	Not specified	91/182	<i>Cases:</i> Single hospital (King George Children's Hospital) <i>Control subjects:</i> Single hospital (King George Children's Hospital)
Korea ⁷¹	Kwong (1980) Republic of Korea	None	1979	76/62	<i>Cases:</i> Multiple hospitals <i>Control subjects and other control subjects:</i> Multiple hospitals <i>All:</i> paediatric departments of 25 hospitals)
Mexico ⁷⁸	Martinez-Gonzalez (2002) Mexico (Jalisco)	None	1991–5	42/84	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
Argentina ⁷²	Miceli (1986) Argentina (Greater Buenos Aires area)	None	1981–2	51/256	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
Dehli paediatric ⁵⁸	Mittal (1996) India (Delhi)	None	1993–5	128/182	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital

Inclusion criteria	Matching factors	BCG vaccination administration and type	Vaccination dates	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<i>Control subjects:</i> Could not have a history of tuberculosis	Age \pm 2 years, sex and treaty band (proxy for SES)	Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Medical records	Neonatal/childhood	4.4 years	Both
<i>Cases:</i> Consecutive admission of tuberculosis meningitis over a 1 year period <i>Control subjects:</i> Two children admitted on the same day as the case who did not have any neurological symptoms	Unmatched	Not specified Strain: not specified	Not specified	Scar, participant recall	Neonatal/childhood	0–12 years	Both
<i>Cases:</i> Neonates with tuberculosis meningitis <i>Control subjects:</i> Pulmonary tuberculosis <i>Other control subjects:</i> Diseases other than tuberculosis and its related conditions (including leukaemia and acute cancer)	Age (+ or - 3 months)	Not specified Strain: not specified	Not specified	Not specified	Not specified	Infant (< 1 year)	Both
<i>Cases:</i> Extrapulmonary tuberculosis, complete medical files <i>Control subjects:</i> Appendicitis patients from the same hospital	Age, nutritional status and SES of hospital	Intradermal injection Strain: not specified	Not specified	Medical records, vaccination card, scar	Neonatal/childhood	Infant (< 1 year)	Both
<i>Control subjects:</i> Inpatients with diseases unrelated to BCG vaccination or tuberculosis	Unmatched	Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Scar	Neonatal/childhood	Infant (< 1 year)	Both
<i>Cases:</i> All cases 12 years or younger admitted for the first time for paediatric tuberculosis meningitis for one consecutive calendar year (1993) <i>Control subjects:</i> All children paediatric ward without tuberculosis meningitis on 1 day in 1995 <i>Other control subjects:</i> All children on paediatric ward without tuberculosis meningitis on another day in 1995 3 weeks after the first vaccination	Unmatched	Not specified Strain: not specified	Not specified	Scar	Neonatal/childhood	0–12 years	Both

Study name	Author (year Country/Region)	Additional/duplicate references	Recruitment period	Number vaccinated/unvaccinated	Source of cases/control subjects
Myanmar ⁷⁴	Myint (1987) Myanmar (Rangoon)	None	1983–5	311/1536	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
Birmingham UK ³³	Packe (1988) UK (Birmingham)	⁸⁰	1965–85	108/432	<i>Cases:</i> Local Surveillance <i>Control subjects:</i> Vaccination records
Asian children in UK ³²	Rodrigues (1991) UK (Bolton, Bradford, Brent, Dudley, Leicester, Manchester, Newham, Redbridge, Rochdale, Sandwell, Tameside, Walsall, Waltham Forest and Wolverhampton)	None	9999–9999	111/555	<i>Cases:</i> Local Surveillance <i>Control subjects:</i> Other district child health registry and school health records
Cali children ⁷⁰	Shapiro (1985) Colombia (Cali)	None	1977–1982	178/320	<i>Cases:</i> Multiple hospitals (12 municipal respiratory clinics) <i>Control subjects:</i> Household members

Inclusion criteria	Matching factors	BCG vaccination administration and type	Vaccination dates	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<p><i>Cases:</i> Children < 5 years of age, residing in Rangoon, admitted to the children's hospital with the diagnosis of one of the various forms of tuberculosis</p> <p><i>Control subjects:</i> Non-tuberculosis and non vaccine-preventable disease cases selected from both the inpatients and outpatients of the same hospital as tuberculosis cases during the 3 months in which the cases were registered</p>	Age, sex and sector of residence	Intradermal injection Strain: Tokyo	Not specified	Vaccination card, parent of participant recall, scar	Neonatal/childhood	Infant (< 1 year)	Both
<p>Asian ethnic origin; born between 1965 and 1979.</p> <p><i>Cases:</i> Registered between 1965 and 1985 notified subjects given anti-tuberculosis treatment, whether tuberculin positive or negative, who had no clinical, radiological or bacteriological evidence of tuberculous disease were considered to have received chemoprophylaxis were excluded</p>	Month and year of birth, sex	Intradermal injection Strain: Glaxo	Not specified	Vaccination records	Neonatal/childhood	0–3 months	Both
<p>Children of Asian ethnic origin born in the UK</p> <p><i>Cases:</i> Could not have had their diagnosis changed from tuberculosis or been given chemoprophylaxis only</p>	Sex, age, place of residence	Not specified Strain: not specified	Not specified	Child health registry and school health records	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> Diagnosis receiving tuberculosis treatment after 1977 through to current treatment in 1982; for those not on treatment in 1982 a positive source history of tuberculosis required</p> <p><i>Control subjects:</i> < 15 years with no previous tuberculosis diagnosis, no tuberculosis symptoms, and negative chest radiograph. Only one case included per household (first diagnosis)</p>	Household	Not specified Strain: Glaxo, Tokyo. Danish post 1978	Not specified	Vaccination card, parent of participant recall, scar	Neonatal/childhood	0–15 years	Both

Study name	Author (year Country/Region)	Additional/ duplicate references	Recruitment period	Number vaccinated/ unvaccinated	Source of cases/control subjects
Bangkok children ⁶⁵	Sirinavin (1991) Thailand (Bangkok)	None	1987–8	75/207	<i>Cases:</i> Single hospital (Ramathibodi or Children's Hospital) <i>Control subjects:</i> Single hospital
Osaka Children ⁷⁶	Takamatsu (1995) Japan (Osaka)	None	1988–94	59/114	<i>Cases:</i> Single hospital (Osaka Prefectural Habikino Hospital) <i>Control subjects:</i> Single hospital
India ⁵⁹	Thilothammal (1996) India (Madras)	None	1990–2	107/321	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
São Paulo ⁶⁸	Wunsch-Filho (1990) Brazil (São Paulo)	None	1981–3	72/586	<i>Cases:</i> Multiple hospitals <i>Control subjects:</i> Neighbourhood <i>Other control subjects:</i> Single hospital
Nagpur hospital ⁶²	Zodpey (1996) India (Nagpur)	Additional: ^{81–86} Duplicate: ^{87, 88}	1994	877/877	<i>Cases and control subjects:</i> Single hospital (Government Medical College Hospital)

Inclusion criteria	Matching factors	BCG vaccination administration and type	Vaccination dates	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<p><i>Cases:</i> Children < 15 years old diagnosed between 1987–8 with tuberculosis</p> <p><i>Control subjects:</i> The first 1–4 children identified from the same hospital as the case that could be matched to the case who were considered free from tuberculosis using the same diagnostic procedures as cases and who never received tuberculosis chemoprophylaxis</p>	Age and district of birth	<p>Intradermal injection</p> <p>Strain: Glaxo, Pasteur and Tokyo</p>	Not specified	Participant recall	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> All consecutive tuberculosis cases among children with known BCG vaccination status</p> <p><i>Control subjects:</i> Two for each case; non-tuberculosis cases from the same paediatric department</p>	Age, sex, year of admission, place of residence	<p>Intradermal injection</p> <p>Strain: not specified</p>	Not specified	Vaccination card, parent of participant recall	Neonatal/childhood	Not specified	Both
<p><i>Cases:</i> Incident tuberculous meningitis cases treated before referral, with no chronic medical illness or malignancy and current immunosuppressive treatment</p> <p><i>Control subjects:</i> children Attending the same hospital who had febrile convulsions without other neurological abnormality</p>	Age and sex	<p>Assumed intradermal (BCG vaccination status assessed through scar)</p> <p>Strain: not specified</p>	Not specified	Medical records, parent of participant recall, scar	Neonatal/childhood	6 months to 12 years	Both
<p>Residents of the Metropolitan Region of São Paulo</p> <p><i>Cases:</i> Notified cases of tuberculous meningitis born after 1978 with information on vaccination status</p> <p><i>Control subjects:</i> Born after 1978</p> <p><i>Other control subjects:</i> Not suspected to have had tuberculosis or other vaccine-preventable diseases</p>	Residence and SES. Sex and age	<p>Assumed intradermal (BCG vaccination status assessed through scar)</p> <p>Strain: Moreau</p>		Not stated, vaccination card, parent of participant recall, scar, health centre archives	Neonatal/childhood	Infant (< 1 year), young childhood (1–5 years)	Both
<p>Born 1962 or later</p> <p><i>Cases:</i> Incident cases of tuberculosis presenting at hospital</p> <p><i>Control subjects:</i> Patients admitted for conditions other than leprosy or tuberculosis who did not have a history of tuberculosis, family history of tuberculosis or history of isoniazid use</p>	Age, sex, SES	<p>Assumed intradermal (BCG vaccination status assessed through scar)</p> <p>Strain: not specified</p>	1962 to 'not specified'	Vaccination card, parent of participant recall, scar	Neonatal/childhood	Infant (< 1 year), 0 years	Both

Study name	Author (year Country/Region)	Additional/ duplicate references	Recruitment period	Number vaccinated/ unvaccinated	Source of cases/control subjects
Canada ⁶⁴	Young (1986) Canada (MB)	None	1979–83	71/213	<i>Cases:</i> Local Surveillance <i>Control subjects:</i> Neighbourhood
Lucknow children ⁶⁰	Awasthi (1999) India (Lucknow)	None	1995–7	192/70	<i>Cases and control subjects:</i> Single hospital (Paediatrics department at King George Medical College)
Nepal ⁷⁵	Pust (1984) Nepal (Gorkha District)	None	1983–4	100/100	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital
Papua New Guinea children ⁶⁹	Murtagh (1980) Papua New Guinea (Port Moresby)	None	1975–8	114/121	<i>Cases:</i> Single hospital <i>Control subjects:</i> Single hospital

9999, missing.

Inclusion criteria	Matching factors	BCG vaccination administration and type	Vaccination dates	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<p><i>Cases:</i> new active cases of tuberculosis, born on or after 1 January 1965, < 15 years at diagnosis</p> <p><i>Control subjects:</i> alive and born on or after 1 January 1965 from same communities as cases, never had active tuberculosis up to the time of the investigator's site visit</p>	Unmatched	Intradermal injection Strain: not specified	Not specified	Medical records, vaccination card	Neonatal/childhood	Infant (< 1 year)	Both
<p>Children 1 month to 12 years old</p> <p><i>Cases:</i> Admitted to with a diagnosis of tuberculosis meningitis</p> <p><i>Control subjects:</i> Every paediatric patient admitted after the third consecutive case without CNS disorder</p>	Unmatched	Not specified Strain: not specified	Not specified	Scar	Neonatal/childhood	Infant (< 1 year)	Both
<p>< 5 years old</p> <p><i>Cases:</i> tuberculosis cases under treatment or beginning treatment in the last 3 years</p> <p><i>Control subjects:</i> children with presentation that could not be attributed to tuberculosis, complaint did not include any cough of any duration, fever for > 2 days, neck adenopathy, spinal deformity, signs or symptoms or meningitis, psoas abscess or skin tuberculosis. Could not have a past history of cough or fever for > 3 days or any of the signs and symptoms that were used as inclusion for the cases</p>	Age and sex	Intradermal injection Strain: not specified	Not specified	Scar, medical records	Neonatal/childhood	Infant (< 1 year)	Both
<p><i>Cases:</i> Laboratory confirmed cases of tuberculosis with information on BCG vaccination status among children given anti-tuberculosis therapy</p> <p><i>Control subjects:</i> Children admitted to the surgical ward of the children's section of an unnamed hospital</p>	Unmatched	Not specified Strain: not specified		Vaccination card, scar	Neonatal/childhood	9999	Both

Cohort studies

Study name	Author (year) Country/ region	Additional/ duplicate references	Years of recruitment	<i>n</i> cohort (<i>n</i> BCG vaccinated/ <i>n</i> unvaccinated)	Source of population
<i>Contact studies</i>					
Edinburgh 1977 contacts ⁹⁷	Capewell (1984) UK (Edinburgh area)	None	1977–81	5416 (1821/3595)	Local surveillance: index cases were notifications in the Edinburgh area
Seoul contacts ¹²⁰	Jin (1989) Republic of Korea (Western Seoul)	None	1984–6	1223 (806/417)	Multiple hospitals: index cases from seven health centres
Bangui contacts ¹²¹	Lanckriet (1995) Central African Republic (Bangui)	None	1989–91	1000 (896/104)	Single hospital
Edinburgh contacts ⁹⁸	Rubilar (1995) UK (Edinburgh area including East Lothian, Midlothian and the City of Edinburgh)	None	1982–91	3366 (1605/1761)	National surveillance: tuberculosis notifications in the Edinburgh area
UK contacts ⁹⁹	Horne (1978) UK	None	1973–4	4668 (1081/3587)	Multiple hospitals: index cases from 37 clinics

Population inclusion criteria	Follow-up method	BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<p><i>Index cases:</i> Notifications of tuberculosis during the period 1977–1981</p> <p><i>Contacts:</i> Both ‘close’ and ‘casual’ contacts were included according to the British Thoracic Association study criteria</p>	Chest radiograph and tuberculin test at 3 and 6 months’ follow-up	Not specified Strain: not specified		Not specified	Not specified	Not specified	Both
<p><i>Index cases:</i> smear positive pulmonary tuberculosis case</p> <p><i>Contacts:</i> Children < 5 years of age living in the same home as the index case; contacts could also be children who had died in the 6 months preceding the detection of the index case</p>	Chest radiograph at 3 months follow-up	Intradermal injection Strain: Pasteur, 1173P2		Vaccination card, parents of participant recall, scar	Neonatal	Neonatal (< 1 year)	Both
<p><i>Index cases:</i> Contagious tuberculosis cases with sputum smear positive for Koch’s bacillus detected in the hospital’s tuberculosis ward and living in Bangui</p> <p><i>Contacts:</i> Children < 7 years old, living in the same concession as the index case</p>	Chest radiograph at 3 and 6 months’ follow-up	Intradermal injection Strain: Pasteur, Mérieux		Vaccination card, parents of participant recall, scar	Neonatal	Neonatal (< 1 year)	Both
<p><i>Index cases:</i> Tuberculosis cases</p> <p><i>Contacts:</i> Close and casual contacts as defined by the British Thoracic Association study</p>	Chest radiograph at 3 and 6 months and 1–2 years’ follow-up	Not specified Strain: Not specified		Not specified	Not specified	Not specified	Both
<p><i>Index cases:</i> All newly notified cases of tuberculosis, whether respiratory or non-respiratory, culture positive or negative, were included in the study</p> <p><i>Contacts:</i> Members of the same household as the index case who share kitchen and/or bathroom facilities, or who are very close associates</p>	Chest radiograph every year for 2 years	Not specified Strain: not specified		Not specified	Not specified	Not specified	Both

Study name	Author (year) Country/ region	Additional/ duplicate references	Years of recruitment	<i>n</i> cohort (<i>n</i> BCG vaccinated/ <i>n</i> unvaccinated)	Source of population
<i>Prospective cohorts</i>					
Oslo nurses ¹²³	Heimbeck (1938) Norway (Oslo)	Duplicate: 88,126–131	1927–36	785 (501/284)	Student nurses at Ullevål Hospital
Richmond infants ⁹³	Kendig (1957) USA (Richmond, VA)	None	1949–56	1533 (738/795)	Single hospital: Well Baby Clinic
Trysil Norway ¹⁰⁴	No author (1930) Norway (Trysil)	None	1927–9	1250 (1079/171)	Country district surveillance
Rzeszow children ¹¹⁸	Kubit (1983) Poland (Rzeszow)	None	1965	4614 (2531/2083)	Rzeszow
New York infants ⁹¹	Kereszturi (1929) USA (NY)	Additional: ^{12,125,} 132–135	1927–32	579 (157/422)	Infants from tuberculous families
Bougie schoolchildren ¹¹⁷	Sarrouy (1957) Algeria (Bougie)	None	1950	4465 (1428/3037)	Schoolchildren (one school)
Northern France schoolchildren ¹⁰⁹	Gernez-Rieux (1973) France (Northern France)	Additional : 136–138	1948–51	18,787 (15,618/3169)	Schoolchildren 6–14 years
Karonga ²⁴	Ponnighaus (1992) Malawi (Karonga district)	Duplicate: ¹²⁴	1979–89	83,455 (–/–)	Local surveillance: Karonga district
Norway 1947 ¹⁰¹	Borgen (1951) Norway (Aker/ Oslo)	None	1947–9	1696 (1102/594)	General population
Virginia infants ⁹⁴	Kendig (1969) USA (VA)	None	1948–68	105 (30/75)	Not specified
Boston nurses ⁸⁹	DeFriez (1957) USA (Boston, MA)	None	1947–51	149 (141/8)	Student nurses

Population inclusion criteria	Follow-up method	BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Tuberculin negative	Medical records	Subcutaneous injection Strain: not specified		Research study records	Research	Adult (> 19 years)	Female
< 6 months old, TST of 0.1 mg and chest radiograph negative	Screening (chest radiograph and TST) every 6 months	Intradermal injection Strain: not specified		Research study records	Research	Neonatal (< 1 year)	Both
Tuberculin negative for vaccinated group	Not specified	Intradermal injection Strain: not specified		Not specified	Not specified	Not specified	Both
Children 1–14 years	Not specified	Intradermal injection Strain: not specified		Scar	Not specified	Young children (1–5 years)	Both
No indication to tuberculosis by PPD, chest radiograph, or physical examination if > 1 month old	Not specified	Subcutaneous and intradermal injection Strain: not specified		Research study records	Research	Neonatal (< 1 year), young children (1–5 years) Range: 0–6 years	Both
All children	Yearly screening (chest radiograph)	Intradermal injection Strain: not specified		Scar	School vaccination	Young children (1–5 years), older children (6–11 years), teen (12–18 years)	Both
<i>Vaccinated:</i> Negative IDR to 10 UI tuberculin <i>Control subjects:</i> Non -vaccinated if negative IDR to 10 UI tuberculin and not vaccinated through parental refusal or other circumstances	School records, yearly examinations (chest radiograph and tuberculin test). Questionnaire and house-visits participants lost to follow-up	Intradermal injection Strain: Pasteur		Medical records	Research	Older children (6–11 years), teen (12–18 years)	Both
No doubtful scar at examination and conflicting records or HIV positive (however, not all participants were HIV tested)	Participant recall from household survey and matching to hospital data	Intradermal injection Strain: Glaxo		Scar	Neonatal	Young children (1–5 years), older children (6–11 years), teen (12–18 years)	Both
Mass chest health survey <i>Vaccinated:</i> Tuberculin negative	Mass screening (chest radiograph)	Not specified Strain: not specified		Not specified	Not specified	Teen (12–18 years), adult (> 19 years)	Both
Children born to tuberculous mothers	Tuberculosis registry data	Intradermal injection Strain: not specified		Not specified	Neonatal	Neonatal (< 1 year)	Both
<i>Vaccinated:</i> Tuberculin negative	Medical records	Intradermal injection Strain: not specified		Not specified	Occupational	Adult (> 19 years)	Female

Study name	Author (year) Country/ region	Additional/ duplicate references	Years of recruitment	n cohort (n BCG vaccinated/n unvaccinated)	Source of population
Bornholm ¹²²	Olsen (1953) Denmark (Bornholm)	Duplicate: ¹³⁹	1936–45	11,585 (4413/7172)	Local surveillance
Brazil REVAC ⁶	Barreto (2005) Brazil (Salvador and Manaus)	Additional: ¹⁴⁰	1996–8	239,936 (124,342/115,594)	Local schools
<i>Retrospective cohorts</i>					
Lyon students ¹⁰⁸	Despieres (1966) France (Lyon)	None	1956–63	34,886 (7875/27,011)	University students
Norway ¹⁰²	Tverdal (1988) Norway	None	1956–73	1,047,550 (961,239/86,311)	General population
Dublin nurses ¹¹⁵	Counihan (1956) Ireland (Dublin)	None	1949–54	80 (78/2)	Student nurses
Dutch nurses ¹¹²	Bergsma (1950) Netherlands (Harderwijk)	Duplicate: ¹⁴¹	1939–50	137 (60/77)	Single hospital: student nurses
Hesse 23 districts ¹⁰⁶	Daelen (1953) Germany (Hesse region)	None	1947–9	162,569 (70,424/92,145)	23 districts of Hesse
Hamburg children ¹⁰⁵	Ehregut (1977) Germany (Hamburg)	None	9999–9999	46,258 (33,735/12,523)	Local surveillance: Hamburg
Strasbourg students ¹¹⁰	Vaucher (1951) France (Strasbourg)	None	1947–9	2526 (1953/573)	Strasbourg university students
Philadelphia nurses ⁹²	Chakravarty (1958) USA (Philadelphia, PA)	None	1950–5	536 (513/23)	Student nurses from Philadelphia general hospital

Population inclusion criteria	Follow-up method	BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
<i>Vaccinated:</i> Tuberculin negative	Two mass screening (chest radiograph)	Intradermal injection Strain: Danish		Not specified	Adult and late childhood mass vaccination	Older children (6–11 years), teen (12–18 years), adult (> 19 years)	Both
Children in state schools, in urban areas of cities, not for disabled children, were not closed for renovation during the study implementation and did not have < 50 students	Matching to surveillance data	Intradermal injection Strain: Moreau		Scar	Research	Neonatal (< 1 year)	Both
18- to 25-year-olds, proper BCG vaccination by official body or private GP who provided complete certificate of vaccination and controlled for post-vaccination allergy controlled 3–6 months after BCG vaccination and regular yearly control of allergy after this and a maximum of one year since the last allergy control and tuberculosis disease screen	Matching to surveillance data and medical records	Not specified Strain: not specified		Vaccination card	Not specified	Neonatal (< 1 year), young children (1–5 years), older children (6–11 years), Teen (12–18 years)	Both
Tuberculin negative Norwegian children age 13 years between 1956 and 1972 with no prior tuberculosis before 13 years	Matching to surveillance data	Intradermal injection Strain: not specified		Mandatory school records	School vaccination	Teen (12–18 years)	Both
Normal chest radiographs on entry. Tuberculin negative for vaccinated group	Matching to hospital data	Not specified Strain: not specified		Not specified	Occupational	Adult (> 19 years)	Female
Working at sanatorium for > 6 months during study period	Occupational screening	Intradermal injection Strain: Danish		Occupational records	Occupational	Adult (> 19 years)	Female
3- to 18-year-olds tested tuberculin negative in one or two tests (Moro and Mantoux)	Matching to surveillance data	Not specified Strain: Danish		Medical records	Neonatal	Young children (1–5 years), older children, (6–11 years), teen (12–18 years)	Both
Children born in 1954 and 1963 in Hamburg	Matching to surveillance data and medical records	Not specified Strain: not specified		Medical records	Neonatal	Neonatal (< 1 year)	Both
Tuberculin negative	Screening	Intradermal injection Strain: not specified		University medical records	Vaccination upon entry to university	Adult (> 19 years)	Both
Tuberculin negative	Biannual screen (chest radiography and clinical examination)	Percutaneous injection Strain: not specified		Research study records	Research	18–20 years	Female

Study name	Author (year) Country/ region	Additional/ duplicate references	Years of recruitment	<i>n</i> cohort (<i>n</i> BCG vaccinated/ <i>n</i> unvaccinated)	Source of population
US physicians ⁹⁵	Barrett-Connor (1979) USA	None	1974–5	3439 (509/2930)	US physicians who attended US medical schools
Jordan ¹¹⁹	Batieha (1998) Jordan	None	1980–6	705,037 (492,776/212,261)	National surveillance
Chicago medical students ⁹⁰	Geiseler (1986) USA (Chicago, IL)	Duplicate: ¹⁴²	1938–81	2242 (1145/1097)	Medical school graduates from one institution
Uruguay infants ¹¹⁴	Gomez (1994) Uruguay (Montevideo)	Duplicate: ^{143–145}	1943–52	5632 (3183/2449)	Single hospital: Pedro Visca Hospital
Medical students UK ¹⁰⁰	Verney (1955) UK (Aberdeen, Belfast, Birmingham, Cambridge, Dublin, Edinburgh, Glasgow, Leeds, Oxford and Sheffield)	None	1949–54	3022 (2630/392)	Medical students and student nurses
Siblings cohort ¹⁰⁷	Liebkecht (1957) Germany	None	1949–54	272 (264/8)	Children in health authority locally that authors belong to (no information on where that is)
Edinburgh ⁹⁶	Capewell (1997) UK (Edinburgh and Midlothian)	None	1985–93	48,706 (48,094/612)	Local surveillance
Dusseldorf children ⁷	Trub (1970) Germany (Dusseldorf county)	None	1954–67	453,297 (187,607/265,690)	General population
Ancona children ¹¹¹	Mariotti (1956) Italy (Ancona)	None	1938–40	4933 (2467/2466)	General population

Population inclusion criteria	Follow-up method	BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Tuberculin-negative physicians working in a state that has a legal although not necessarily enforced requirement for annual tuberculin testing or chest radiographs of all hospital employees	Participant recall/self-assessment from questionnaire	Not specified Strain: not specified		Participant recall	Occupational	Adult (> 19 years)	Both
From the 1980–6 birth cohort	Medical records/hospital data	Intradermal injection Strain: Copenhagen		Records derived from surveys conducted by the Directorate of Chest Diseases	Neonatal	Neonatal (< 1 year), young children (1–5 years), older children (6–11 years)	Both
Graduates from 1938–81 who responded to a questionnaire <i>Vaccinated:</i> Tuberculin negative	Participant recall/self-assessment from questionnaire	Intradermal injection Strain: Pasteur		Participant recall	Occupational	Adult (> 19 years)	Both
Children 0–3 years admitted to paediatric service of hospital	Hospital data	Percutaneous injection Strain: not specified		Scar, ink tattoo of scar	Neonatal	Neonatal (< 1 year)	Both
Tuberculin negative	Screening (chest radiography compulsory for matriculation)	Intradermal injection Strain: Danish, Pasteur		Not specified	Occupational	Adult (> 19 years)	Both
<i>Vaccinated:</i> Children at risk of tuberculosis infection due to exposure to active tuberculosis source who were vaccinated <i>Control subjects:</i> Tuberculin negative, unvaccinated siblings of the vaccinated children	Matching to surveillance data	Not specified Strain: not specified		Medical records	Neonatal	Neonatal (< 1 year), young children (1–5 years)	Both
Child eligible for schools tuberculin testing, aged 13 years between 1984/85 and 1992/93 inclusive, attending a local school at age 13 years <i>Vaccinated:</i> Tuberculin negative	Medical records	Intradermal injection Strain: not specified		Schools medical service records	Neonatal	Not specified	Both
Children from 1 to 15 years old living in Dusseldorf region (either county cities or rural areas)	Matching to surveillance data	Intradermal injection Strain: not specified		Vaccination records	Neonatal	Neonatal (< 1 year)	Both
Children 1 month to 5 years in city of Ancona	Medical records, hospital data	Not specified Strain: not specified		Medical records	Neonatal	Neonatal (< 1 year), young children (1–5 years)	Both

Study name	Author (year) Country/ region	Additional/ duplicate references	Years of recruitment	<i>n</i> cohort (<i>n</i> BCG vaccinated/ <i>n</i> unvaccinated)	Source of population
Morocco children ¹¹⁶	Gaud (1952) Morocco (Yacoub el Mansour)	Duplicate: ¹⁴⁶	1950–3	1601 (830/771)	General population
Swedish conscripts ¹¹³	Dahlstrom (1951) Sweden	Additional: ¹⁴⁷ Duplicate: ¹⁴⁸	1941–4	61,474 (36,235/25,239)	New military recruits to Swedish army
Norwegian deported ¹⁰³	Oeding (1946) Norway	None	1940–5	227 (62/165)	Norwegian deportees to Germany during WWII

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Population inclusion criteria	Follow-up method	BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Children up to 20 years living in Yacoub el Mansour, testing negative for 10 UI Mantoux	Screening at 6 months follow-up (chest radiography)	Intradermal injection Strain: not specified		Research-related	Research	All ages (range 0–20 years)	Both
Tuberculin negative	Military medical records and dispensation records	Intradermal injection Strain: Sahlgrenska Sjukhuset, Gothenburg		Military medical records	Occupational	Adult (> 19 years)	Male
<i>Vaccinated:</i> Tuberculin negative	Medical records	Not specified Strain: not specified		Medical records	Not specified	All ages	Male

Case population studies

Study name Additional/ duplicate references	Author (year)	Case-finding start and end date	Source of population	BCG vaccination ascertainment/ definition	BCG vaccination type	Age at vaccination/ age at outcome assessment
Malaysia 0–19 year olds ¹⁵⁹	WHO (1982) Malaysia	1977–9	0- to 19-year olds with notified case of tuberculosis in national records in 1977–9	Scar	Intradermal	Early childhood/ 0–19 years
Malaysia meningitis ¹⁵⁹	WHO (1982) Malaysia	1976–8	0- to 14-year-olds admitted to Government hospitals in Malaysia	Scar	Intradermal	Early childhood/ 0–14 years
Korea neonatal ¹⁵⁹	WHO (1982) Republic of Korea	1976	Children treated for tuberculosis in a large hospital	Scar	Intradermal assumed	Not reported but all in 0- to 4-year age group so assumed infant/ 0–4 years
Britain surveys ¹⁵³ Additional ^{171,172}	Sutherland (1987) UK	1973 1978 1983	Tuberculin negative 15–24 years olds living in Britain at age 13 years	Information sought through local health and education authorities; BCG vaccination reported by clinician confirming details of notified case in survey returns	Intradermal	13 years/ 15–24 years
Birmingham schoolchildren 54–58 ¹⁵² Data overlaps for 2 years with ¹⁷²	Springett (1959) UK	1954–8 1956–62 1962–9	Tuberculin-negative children in school in Birmingham at from 1954–8. Given liquid BCG vaccination (Copenhagen)	Not reported	Intradermal	13 years/ 13–18 years Age 13 years in 1953–61/ 14–16 years in 1956–62 Age 13 in 1961–9/ 13–14 in 1962–9
Israel neonatal ¹⁶²	Zilber (1984) Israel	1956–79	Infants born in Israel 1956–79 whose tuberculosis began at age 0 to 12 years during this period with known vaccination status	Notification forms	Not reported	Neonatal/ 0–12 years
Canadian nurses ¹⁵⁶	Burill (1985) Canada	1969–79	Tuberculin-negative Canadian-born women in nursing and related assisting occupations in British Columbia	Recorded in case files	Not reported	At time of training/ > 18 years

Number of cases	Case-definition	Number vaccinated/ unvaccinated	Population vaccination ascertainment	Total estimated population during study period (Vaccine coverage calculated or given%)	Total estimated vaccinated/ unvaccinated
719	Notified tuberculosis case	495/224	Vaccine coverage determined in national survey 1976–7	17,544,000 (85%)	14,919,000/ 2,625,000
20	Tuberculosis meningitis	9/11	Not reported	Not reported (83%)	Not reported/ not reported
53	Treated for tuberculosis	7/46	Not reported	Not reported (60%)	Not reported/ not reported
465	Notification of tuberculosis in target population with survey forms returned by clinician	NA/NA	Local authority returns to the health departments for school-children and students	NA (NA)	NA/NA
381		212/168.8		6,812,000 (83%)	5,630,000/ 1182000
313		168/145.4		7,030,000 (99%)	5,783,000/ 1,247,000
40	Notified tuberculosis	4/36	Participant figures	146,319 (67%)	98,140/ 48,179
115.6 (estimated notification in unvaccinated)	Notified tuberculosis	21/94.6	Participant figures	559,470 (66%)	371,414/ 188,056
79.4 (estimated notification in unvaccinated)	Notified tuberculosis	17/62.4	Participant figures	492,744 (80%)	395,315/ 97,429
270	Pulmonary and extrapulmonary tuberculosis at any stage of activity	164/106	Calculated from denominator data (published and unpublished) from the Central Bureau of Statistics of Israel	11,972,249 (71%)	8,552,917/ 3,419,332
22	Pulmonary (post primary, pleural, primary) and extrapulmonary (lymphadenitis, genitourinary, osteoarticular, other)	13/9	Survey of nurses employed at two hospitals randomly selected from the British Columbia register of hospitals applied to population data from statistics Canada and the registered Nurses Association of British Columbia for the population studied over the time period	152,807 (76%)	118,439/ 34,368

Study name Additional/ duplicate references	Author (year)	Case-finding start and end date	Source of population	BCG vaccination ascertainment/ definition	BCG vaccination type	Age at vaccination/ age at outcome assessment
Brazil meningitis ¹⁶⁶	Martins (1985) Brazil	1983–3	0- to 4-year-olds	Not reported	Intradermal	Neonatal/ 0–4 years
South Asian adults ¹⁵⁵	Chaloner (2002) UK	1982–2000	Indian subcontinent new immigrants who had entered the districts of Blackburn, Hyndburn and Ribble Valley between 1 January 1982 and 31 December 1998 inclusive, with a Heaf grade 0–1 and to who BCG vaccination had been administered and still registered locally with a GP	Recorded on individual cards and filed	Not reported, because of dates and population, assumed intradermal	Adult aged 15–34 years (vaccination upon entry into UK)/> 18 years
Quebec meningitis ¹⁵⁷	Frappier (1962) Canada	1949–56	0- to 10-year-olds	Medical records	Scarification (subcutaneous)	Neonatal/ 0–10 years
Taiwan meningitis ¹⁶⁷	Chan (2008) Taiwan, Province of China	2002–7	0- to 5-year-olds	Not reported	Not reported	Neonatal/0
Bydgoszcz children ¹⁶⁰	Krzyszowska (1956) Poland	1950–3	0–14 years	Medical records	Intradermal	Neonatal/ 10–14 years
Singapore schoolchildren ¹⁶⁵	Chew (1974) Singapore	1972	Tuberculin- negative secondary schoolchildren	Screening of all students for presence of scar	Intradermal	Neonatal or preschool (< 6 years) or primary school entry (6 years) or primary school departure (12–13 years)/0
France schoolchildren ¹⁶⁸ Additional ¹⁷³	Schwoebel (1994) France	1990	Children < 5 years residing in France with CSF sample taken between January 1 and 31 December 1990	BCG vaccination status was reported in collected from laboratories reporting case	Scarification method	Minimum 6 months before <i>M. tuberculosis</i> diagnosis/ 0–4 years
Manchester hospital ¹⁵⁴	Curtis (1984) England	1975–80	0- to 14-year-olds, born to Manchester residents in 1968–80, still present in the city in 1980	Hospital records	Intradermal	Neonatal/0

Number of cases	Case-definition	Number vaccinated/ unvaccinated	Population vaccination ascertainment	Total estimated population during study period (Vaccine coverage calculated or given%)	Total estimated vaccinated/ unvaccinated
Not reported	Bacteriologically confirmed tuberculosis meningitis	Not reported/not reported	Demographic data	Not reported (not reported)	Not reported/ not reported
2	One is sputum smear negative, culture positive and one is sputum smear and culture positive	2/0	NA	Expected number of cases was 16.1 yielding a standardised incidence ratio of 0.124 (0.015 to 0.448) (NA)	NA/NA
139	Bacteriologically/cytologically confirmed death from tuberculosis meningitis (ICD-6)	5/133	Records	8,735,000 (24%)	2,058,000/ 6,632,100
12	Notified tuberculosis meningitis	8/4	Not reported	1,290,000 (97%)	1,251,300/ 38,700
583	'Full clinical investigation' confirming that cases presenting with abnormal chest radiograph pictures were in fact tuberculosis, no other details	23/560	Demographic records	50,208 (43%)	21,730/ 28,478
92	Active tuberculosis	41/51	Detailed records of BCG vaccination held by the school tuberculosis Section of the tuberculosis Control Unit	161,000 (75%)	120,750/ 40250
6	CSF sample culture positive for <i>M. tuberculosis</i> complex	2/4	BCG coverage based on unpublished data on vaccination coverage from the Department of Statistics at the Ministry of Health	3,900,000 (80%)	3,100,000/ 800,000
65	Notified tuberculosis cases plus four found in hospital activity analysis	4 (St Mary's Hospital Manchester)/6 (St Mary's Hospital Manchester) +55 (other hospitals)	Name-counting on weekly returns and systematic 1 in 55 sampling of St Mary's Hospital birth register	674,000 person-years (NA)	High estimate: 152,800 person-years; low estimate: 113800 person- years

Study name Additional/ duplicate references	Author (year)	Case-finding start and end date	Source of population	BCG vaccination ascertainment/ definition	BCG vaccination type	Age at vaccination/ age at outcome assessment
			0- to 14-year-olds, born to at St Mary's Hospital Manchester residents in 1968–80, still present in the city in 1980			Neonatal/0
Czechoslovakia meningitis ¹⁷⁰	Votjek (1960) Czechoslovakia	1954–8	0- to 4-year-olds (born 1954–8, Czech region)	Records	Not reported	Neonatal/0
			0- to 4-year-olds (born 1954–8, Slovak region)	Records	Not reported	Neonatal/0
Quebec pulmonary ¹⁵⁸	Frappier (1971) Canada	1956–61	0–29 years (non- American Indian, 'Eskimo' or immigrant)	Individual files in central BCG record system	Scarification (subcutaneous)	Neonatal or 5–9 years/0
Ireland surveys ¹⁶⁷	Kelly (1997) Ireland	1986	National Tuberculosis Surveys	Areas that have a neonatal vaccination policy and those that do not from National Tuberculosis Surveys of 1986	0	Neonatal/ all ages
		1991	National Tuberculosis Surveys	Areas that have a neonatal vaccination policy and those that do not from National Tuberculosis Surveys of 1991	0	Neonatal/ All ages
Cologne children ¹⁶⁴	Lotschert (1983) Germany	1967–76	0- to 15-year-olds	Medical records	Not reported	Neonatal/ 0–15 years
Hungary 4–14 ¹⁶³ Duplicate ¹⁷⁴	Lugosi (1985) Hungary	1964	Children born in 1950–60 with all form tuberculosis both BCG vaccinated and unvaccinated in 1964	Data on antituberculous measures (including BCG) has been provided by 20 departmental tuberculosis dispensaries based on principles standardised in 1953	Not reported but assumed intradermal owing to time of study	Neonatal + revaccination in those 3–20 years so maybe have some revaccination/ 4–14 years

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Number of cases	Case-definition	Number vaccinated/ unvaccinated	Population vaccination ascertainment	Total estimated population during study period (Vaccine coverage calculated or given%)	Total estimated vaccinated/ unvaccinated
10	Notified tuberculosis cases	4/6	21.9	NA (NA)	High estimate: 521,200 person-years; low estimate: 386,800 person-years
30	Notified tuberculosis meningitis	15/15	Not reported	793,976 (95%)	753,138/40,838
157	Notified tuberculosis meningitis	32/125	Not reported	487,665 (86%)	415,904/71,761
6345	Minimal tuberculosis or moderately advanced or advanced tuberculosis, miliary tuberculosis or primary infection or tuberculous pleurisy	546/5799	Records from individual files from central BCG record system	17,460.5 (38%)	6601.4/10,859.1
756	Not reported	536/220	Areas that have a neonatal vaccination policy and those that do not from National Tuberculosis Surveys of 1986 and 1991	3,496,871 (73%)	2,563,836/933,035
582	Not reported	371/211	Areas that have a neonatal vaccination policy and those that do not from National Tuberculosis Surveys of 1986 and 1994	3,523,399 (88%)	2,499,725/1,023,674
216	Tuberculosis disease (all types)	63/153	Demographic statistic estimations	164,700 (80%)	131,760/32,940
145	All forms of tuberculosis	56/89	Data on antituberculosis measures (including BCG) has been provided by 20 departmental tuberculosis dispensaries based on principles standardised in 1957	660,839 (76%)	499,250/161,589

Cross-sectional studies

Study name	Author (year) Country/region	Additional/ duplicate references	Years of recruitment	Number BCG vaccinated/ number unvaccinated	Source of population	Population inclusion criteria
Contact studies						
Madrid contacts ¹⁷⁵	Castan Vidal (1991) Spain (Madrid)	None	9999	114/101 (109 index cases)	Single hospital	<i>Index cases:</i> recently diagnosed cases of sputum-positive pulmonary tuberculosis with positive bacilloscopy and culture <i>Contacts:</i> All close contacts of index cases < 15 years old
Rio de Janeiro contacts ¹⁷⁹	Kritski (1996) Brazil (Rio de Janeiro and six neighbouring municipalities)	None	1988– 92	153/65 (64 index cases)	Single hospital: Chest Service of the Federal University of Rio de Janeiro	<i>Index cases:</i> Multidrug resistant tuberculosis cases, the first in the household to be diagnosed with tuberculosis and HIV negative <i>Contacts:</i> People living in the same household as the index case during the entire previous 5 years. HIV negative
Bangkok contacts ¹⁸⁸	Padungchan (1986) Thailand (Bangkok)	None	1981– 4	1253/253 (971 index cases)	Single hospital: Central chest clinic	<i>Index cases:</i> Newly detected smear-positive pulmonary tuberculosis cases <i>Contacts:</i> Household child contacts, < 5 years old
Togo contacts ¹⁷⁸	Tidjani (1986) Togo (Lome)	None	9999–9999	875/523 (352 index cases)	Not specified	<i>Index cases:</i> newly detected smear positive pulmonary tuberculosis patients <i>Contacts:</i> ≤ 6 years old, household contact
Togo children ¹⁷⁷	Tidjani (1992) Togo (Lome)	None	1988–9	504/201 (201 index cases)	Single hospital: University of Lome hospital	<i>Index cases:</i> bacteriologically confirmed pulmonary tuberculosis case <i>Contacts:</i> immediate/close contacts of index cases – 6 years old not lost to follow-up and with complete examination results, with definite BCG vaccination status (unknowns excluded)
Irkutsk Russian ¹⁹²	Khadeeva (2003) Russian Federation (Irkutsk region)	None	2003	277/99 (unknown number of index cases)	Local surveillance: Irkutsk region	<i>Index cases:</i> tuberculosis cases <i>Contacts:</i> close relatives of infected cases
Egypt contacts ¹⁸⁹	Mahmoud (1986) Egypt (Bab-El-Shaaria and El-Hussin)	None	9999–9999	200/240 (137 index cases)	Multiple hospitals and chest dispensary	<i>Index cases:</i> Newly diagnosed pulmonary tuberculosis cases with positive sputum by direct smear and/or culture
General population studies						
Kenya ¹⁸⁷	Aluoch (1985) Kenya (Kirinyaga, Kitui, Siaya and Kwale)	None	1979– 82	971/1159	Multiple hospitals	Outpatients from four district hospitals aged ≥ 6 years, with main complaint of cough and/or sputum for 1 month or more or haemoptysis of any duration
Liege children ¹⁸²	Bassleer (1972) Belgium (Liege)	None	1950– 62	1085/4631	Multiple hospitals: tuberculosis dispensaries in Liege	Children examined in dispensaries in 1950 to 1965

BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Vaccination card, scar	Neonatal	Neonatal (< 1 year)	Both
Not specified Strain: not specified	Not specified	Scar	Not specified	Not specified	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: Merieux	Not specified	Vaccination card, scar	Neonatal	Neonatal (< 1 year)	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: Glaxo	Not specified	Parents of participant recall, scar	Neonatal	Neonatal (< 1 year)	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Parents of participant recall, scar	Neonatal/ childhood vaccination	Neonatal (< 1 year), young child (1–5 years)	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	1961–9999	Scar	Neonatal	Neonatal (< 1 year)	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Participant recall, scar	Not specified	Not specified	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Scar	Childhood vaccination	Neonatal (< 1 year), young child (1–5 years), older child (6–11 years), teen (12–18 years)	Both
Assumed intradermal (BCG vaccination status assessed through scar) Strain: not specified	Not specified	Not specified	Not specified	Neonatal (< 1 year), young child (1–5 years), older child (6–11 years), teen (12–18 years), mean: 4 years	Both

Study name	Author (year) Country/region	Additional/ duplicate references	Years of recruitment	Number BCG vaccinated/ number unvaccinated	Source of population	Population inclusion criteria
Surui Indians ¹⁸⁰	Basta (2006) Brazil (Rondonia)	None	2003	699/37	Population subgroup: Surui Indians	Willing participants in the survey
Naples classroom ¹⁸⁵	Biscione (1969) Italy (Naples)	Duplicate: ¹⁹⁴	1967	14/19	Schoolchildren	All children in one classroom where a high percentage of Mantoux positivity was detected in routine screening
Madras ¹⁸⁶	Chandra (1975) India (Madras)	Additional: ¹⁹⁵	1968–70	232/362	Single hospital	Children < 10 years of age recruited through the Employees State Insurance Hospital, all with some type of illness
Vaupes population ¹⁹¹	Garcia (2004) Colombia (Mitú, Vaupes)	None	2001	14/958	165 households in town of Mitú	Part of random cluster sampling (20 clusters, 165 households visited, 972 participants selected)
Bas-Rhin ¹⁸⁴	Lotte (1988) France (Bas- Rhin Region)	None	1965– 84	3,104,656/ 1,159,744	General population: Bas- Rhin region	Children < 15 years
Madrid students ¹⁷⁶	Zapatero- Dominguez (1986) Spain (Madrid)	Duplicate: ¹⁹⁶	1969– 83	58,384/78,485	Students of the Madrid Complutense University	Any student who was observed, upon entry to the university, by the Chest Unit
Lebanese children ¹⁹³	Sleiman (2007) Lebanon	None	2004	2325/1946	Schoolchildren	Children from selected schools in Lebanon aged 3–19 years without chronic disease, undergoing any immunosuppressive treatment, no symptoms of viral illness that could be early signs of measles and would interfere with PPD reading, no allergic diseases
Opstine Zvezdara ¹⁸³	Horvat- Grubac (1963) Yugoslavia (Opstine Zvezdara)	None	1959– 61	3/1	Local surveillance	Families with tuberculosis
Cape Town children ¹⁹⁰	Mahomed (2006) South Africa (Cape Town)	None	1999–2002	2766/48	Multiple hospitals and local surveillance	Children who were < 2 years of age when diagnosed with tuberculosis; born in Cape Town from January 1999 to June 2000 and those born between January 2001 and June 2002; listed in tuberculosis registry and at health facilities as having tuberculosis after review of medical records by study clinicians
Tohoku outpatients ¹⁸¹	Ebina (1959) Japan (north- east/Tohoku)	None	1949– 53	2147/1990	Single hospital: (Research Institute for Tuberculosis and Leprosy, Tohoku University)	BCG vaccinated and unvaccinated persons who, because of symptoms suggestive of tuberculosis, attended the outpatient clinic or treated in the hospital; between 14 and 25 years of age and residing in the north-east district of Japan

BCG vaccination administration and type	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Assumed intradermal (BCG vaccination status assessed through scar Strain: not specified	Not specified	Scar	Not specified	Not specified	Both
Not specified Strain: not specified	1961–2	Not specified	Neonatal	Older child (6–11 years)	Male
Intradermal injection Strain: not specified	Not specified	Not specified	Neonatal	Neonatal (< 1 year)	Both
Assumed intradermal (BCG vaccination status assessed through scar Strain: not specified	Not specified	Scar	Neonatal	Neonatal (< 1 year)	Both
Intradermal injection Strain: not specified	Not specified	Review from regional register	Neonatal	Neonatal (< 1 year), young child (1–5 years), older child (6–11 years)	Both
Assumed intradermal (BCG vaccination status assessed through scar Strain: not specified	Not specified	Vaccination card, Scar	Not specified	Older child (6–11 years), teen (12–18 years)	Both
Assumed intradermal (BCG vaccination status assessed through scar Strain: not specified	Not specified	Scar	Neonatal	Not specified	Both
Not specified Strain: not specified	Not specified	Not specified	Neonatal	Neonatal (< 1 year), young child (1–5 years)	Both
Intradermal injection Strain: Statens, Tokyo	Not specified	Medical records, Parents of participant recall	Neonatal	Neonatal (< 1 year)	Both
Intradermal injection Strain: not specified	Not specified	Not specified	Not specified	Not specified	Both

Outbreak studies

Study name	Author (year) Country/ Region	Additional/ duplicate references	Years of outbreak and subsequent investigation	Number of tuberculosis cases vaccinated/ unvaccinated	Number BCG vaccinated/ Number unvaccinated	Source of population	Inclusion criteria
Danish school ²⁰³	Hyge (1957) Denmark (Copenhagen)	^{204, 205}	1943	0/41	133/105	Single school	School girls in a Danish state school at the time of a tuberculosis epidemic caused by the teacher source case
Cork girls school ¹⁹⁷	Bredin (1991) Ireland (Cork)		1986–90	4/2	342/262	Girls' school	Girls at a girls' school in Cork, Ireland
Cork toddler ¹⁹⁸	Gaensbauer (2009) Ireland (Cork)		2007	0/18	64/204	Two child care centres in Cork, Ireland	Children attending two child care centres where the source cases were two tuberculosis diseased carers
Community C ²⁰⁰	Long (2004) Canada (AB)		1991–2000	1/17	2/30	Community C First Nations outbreak	Paediatric contacts of index cases
Community I ²⁰⁰	Long (2004) Canada (AB)		1991–2000	10/3	18/9	Community I First Nation reserve	Paediatric contacts of index cases
Donegal school ¹⁹⁹	Shannon (1991) Ireland (Donegal)		1986	6/9	909/251	Secondary school	Pupils attending, or recently left, a secondary school in Donegal Ireland
Stockholm dental school ²⁰¹	Bergqvist (1947) Sweden (Stockholm)		1945–6	10/4	44/14	New students entering Stockholm Dentistry school in 1944	Tuberculin negative dentist school students attending same classes as initial case in outbreak
Grade 7 students ²⁰²	Hertzberg (1947) Norway (Oslo)		1941–6	2/77	233/141	Seventh grade students	Seventh grade students offered vaccination

9999, missing.

BCG vaccination administration and type	Vaccination policy	Vaccination period	BCG vaccination ascertainment	Reason for BCG vaccination	Age at BCG vaccination	Gender
Not reported (not reported)	Not reported	1942	Not reported	Not specified	Teen (12–18 years)	Female
Intradermal injection (not reported)	Neonatal BCG vaccination was discontinued in Ireland in December 1972	Not specified	Scar/signed community care records	Neonatal	Neonatal (<1 year)	Female
Not reported (not reported)	Not reported	Not specified	Not reported	Neonatal	Neonatal (<1 year)	Both
Not reported (not reported)	BCG vaccination is offered to Inuit and on-reserve First Nations children born to mothers who tested negative for HIV prenatally	Not specified	Not reported	Neonatal	Neonatal (<1 year)	Both
not reported (not reported)	BCG vaccination is offered to Inuit and on-reserve First Nations children born to mothers who tested negative for HIV prenatally	Not specified	Not reported	Neonatal	Neonatal (<1 year)	Both
Intradermal injection (not reported)	Policy of Community Care Area to give neonatal BCG vaccination	Not specified	Vaccination card/scar	Neonatal/childhood	Neonatal (<1 year), young child (1–5 years), older child (6–11 years)	Both
Not reported (not reported)	Not reported	Not specified	Not reported	Not specified	Not specified	Both
Not reported (not reported)	Not reported	1941–6	Vaccination at school so records held there	School offers vaccination in grade 7	Teen (12–18 years)	Both