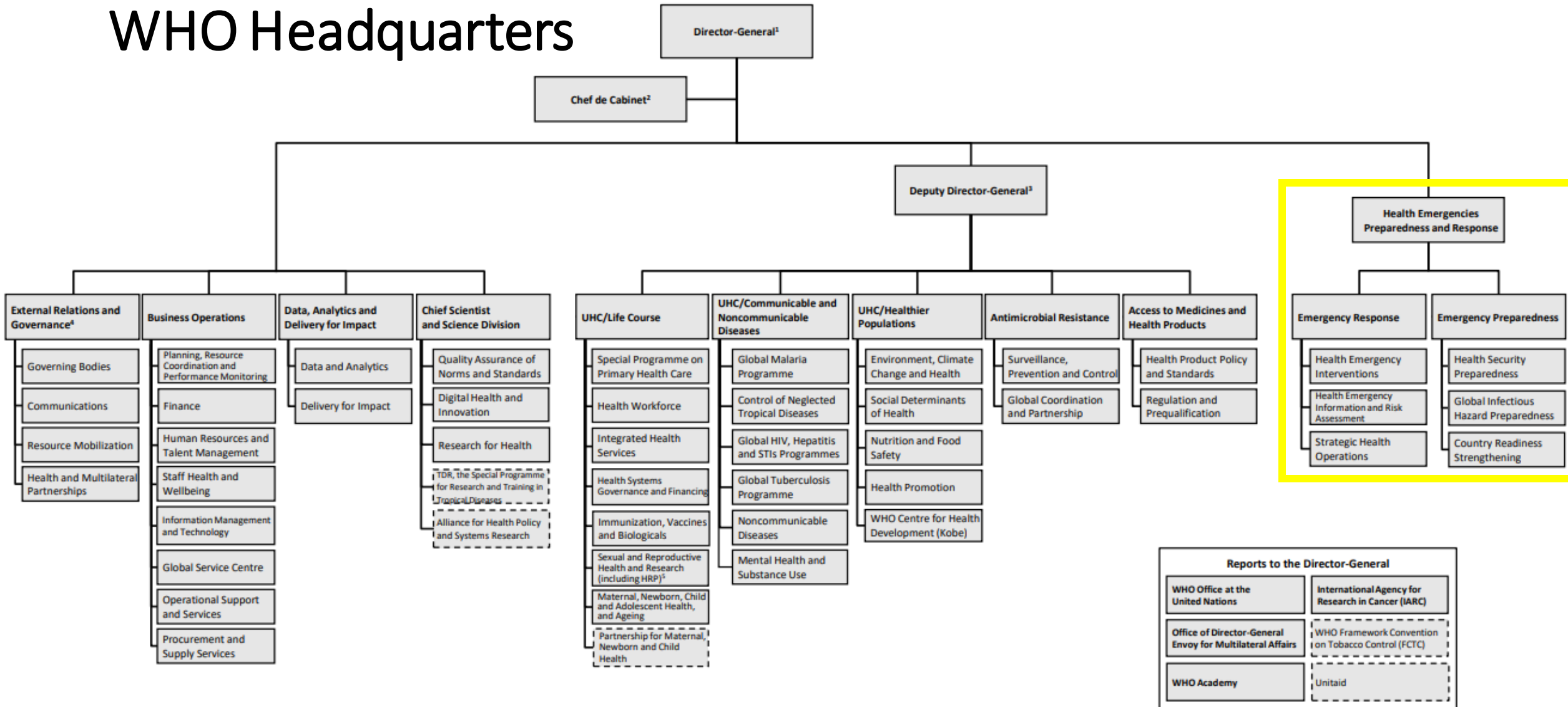


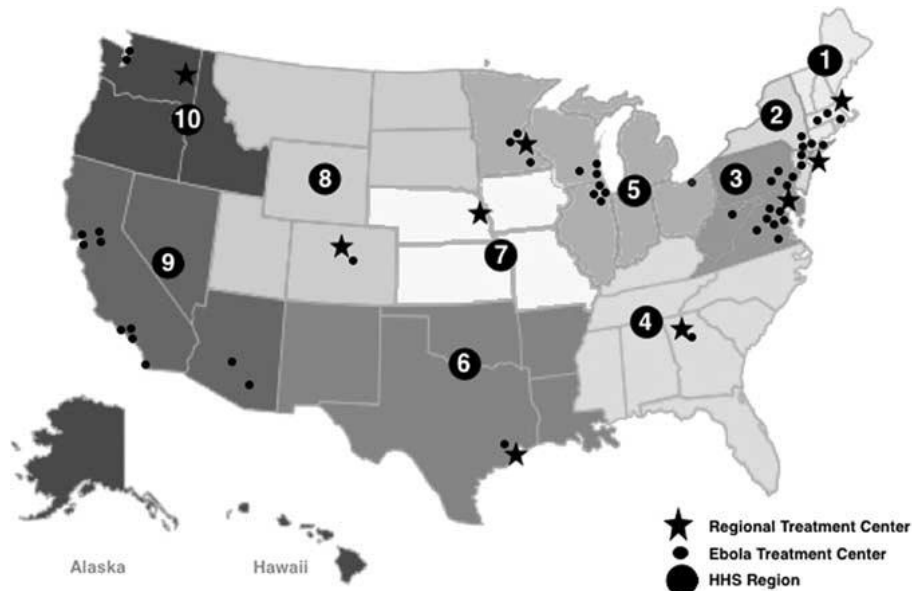
WHO Headquarters



US Dept. Of Health & Human Services (HHS)



- Originally called Health, Education & Welfare (1953).
- Health Dept. was renamed to **HHS** (1980).
- **Public Health Service (PHS)** is its main division (corps).
- HQ: Washington DC, Employees: 80k, Budget: \$1.3T.
- **3 tiers**: Federal, State, Local Health departments.
- **10 Regional offices** what work with State, Local depts.



- **National Institutes of Health (NIH, 1887).**
- Food & Drug Administration (FDA, 1906).
- **Centers for Disease Control & Prevention (CDC, 1946).**
- Indian Health Service (HIS, 1955).
- Centers for Medicare & Medicaid Services (CMS, 1965).
- Health Resources & Services Administration (HRSA, 1982).
- Agency for Toxic Substances & Diseases Registry (ATSDR, 1983).
- Agency for Healthcare Research & Quality (AHRQ, 1989).
- Administration of Children & Families (ACF, 1991).
- Substance Abuse & Mental Health Services Administration (SAMHSA, 1992).
- Administration for Community Living (ACL, 2012).



National Institutes
of Health

National Institutes of Health (NIH)

- NIH is responsible for **biomedical & health research**.
- NIH has **21 institutes & 6 centers** (across all institutes).
- HQ: Bethesda, Employees: 20k, Budget: \$39B.
- Research published in **12mon** to **PubMed Central (PMC)**.
NLM's repository
- National Cancer Institute (NCI, 1937).
- **NI of Allergy & Infectious Diseases (NIAID, 1948).**
- NI of Dental & Craniofacial Research (NIDCR, 1948).
- National Heart, Lung & Blood Institute (NHLBI, 1948).
- NI of Mental Health (NIMH, 1949).
- NI of Diabetes & Digestive & Kidney Diseases (NIDDK, 1950).
- NI of Neurological Disorders & Stroke (NINDS, 1950).
- National Library of Medicine (NLM, 1956).
- NI of Child Health & Human Development (NICHD, 1962).
- NI of General Medical Sciences (NIGMS, 1962).
- National Eye Institute (NEI, 1968).
- NI of Environmental Health Sciences (NIEHS, 1969).
- NI on Alcohol Abuse & Alcoholism (NIAAA, 1970).
- NI on Drug Abuse (NIDA, 1974).
- NI on Aging (NIA, 1974).
- NI of Arthritis & Musculoskeletal & Skin Diseases (NIAMS, 1986).
- NI of Nursing Research (NINR, 1986).
- NI of Deafness & other Communication Disorders (NIDCD, 1988).
- National Human Genome Research Institute (NHGRI, 1989).
- NI on Minority health & Health Disparities (NIMHD, 1993).
- NI of Biomedical Imaging & Bioengineering (NIBIB, 2000).

NI of Allergy & Infectious Diseases (NIAID)

- NIAID is responsible for **basic & applied research** to better understand, treat & prevent **infectious, immunologic & allergic** diseases.
- Worked on development of **vaccines** for Influenza, Hepatitis A, Rotavirus, Pertussis, Pneumonia, RSV.
- Worked on development of **diagnostic tests** for Malaria, Tuberculosis, Norovirus.
- Worked on mother to child transmission (MTCT) of **HIV**.
- It has **4 extramural** divisions (non-members):
 - Div. of Acquired Immunodeficiency Syndrome (DAIDS).
 - Div. of Allergy, Immunology & Transplantation (DAIT).
 - **Div. of Microbiology & Infectious Diseases (DMID).**
 - Div. of Extramural Activities (DEA).
- And **3 intramural** divisions (done within):
 - Div. of Clinical Research (DCR).
 - Div. of Intramural Research (DIR).
 - **Vaccine Research Center (VRC).**
- VRC has **4 laboratories** and **2 programs**:
 - Immunology Laboratory
 - Viral Pathogenesis Laboratory
 - Virology Laboratory
 - Vaccine Production Program Laboratory.
 - Clinical Trials Program
 - Translational Research Program

Centers for Disease Control & Prevention (CDC)

- CDC is responsible for **control & prevention of disease, injury & disability** in **US** and **internationally**.
- Focuses on infectious disease, influenza, food borne pathogens, **antibiotic resistance**, global, travelers', environmental health, **vaccine safety, occupational safety & health**, health promotion, injury prevention & **education**.
- Also conducts research on **NCDs**, e.g. obesity, diabetes.
- Founding member of **International Association of National Public Health Institutes** (IANPHI, 2006, 80 国).
- HQ: Atlanta, Employees: 11k, Budget: \$12B.
- **NC for Health Statistics (NCHS, 1960).**
- **NI for Occupational Safety & Health (NIOSH, 1970).**
Occupational Safety and Health Administration (OSHA)
- NC for Injury Prevention & Control (1992).
- **NC for Immunization & Respiratory Diseases (NCIRD, 1993).**
- **NC for Emerging & Zoonotic Infectious Diseases (NCEZID).**
- NC on Birth Defects & Developmental Disabilities.
- NC for Chronic Disease Prevention & Health Promotion.
- NC for HIV/AIDS, Viral Hepatitis, STD & TB Prevention (NCHHSTP).
- NC for Environmental Health & Agency for Toxic Substances & Disease Registry.



Bio Safety Level (BSL)

- **Enclosed laboratory** facilities for working with dangerous **biological agents**. Lowest level **1** to highest level **4**.
- **BSL1**: used for non-pathogenic microorganisms. Generally used as teaching spaces for high schools & colleges.
- **BSL2**: used for mild disease causing microbes or difficult to spread; Hepatitis A, B, C, HIV, E. Coli, Salmonella.
- **BSL3**: used for potentially lethal or inhalable microbes; biosafety cabinet, protective clothing; SARS-CoV-1/2, MERS-CoV, Chikungunya, Yellow fever, West Nile, Encephalitis.
- **BSL4**: used for fatal or easily transmitted pathogens; class 2/3 biosafety cabinet; autoclave; +ve pressure suit, airlocks, waste decontamination; Ebola, Lassa, Hendra, Nipah, Marburg, Hemorrhagic fever.
- Also used for **extraterrestrial samples**.
- 3 BSL4 facilities in India.
 - High Security Animal Disease Laboratory (HSADL, 1998, Bhopal).
 - Centre for Cellular & Molecular Biology (CCMB, 2009, Hyderabad).
 - **National Institute of Virology (NIV, 2018, Pune).**
- 13 BSL4 facilities in US.
 - US Army Medical RI of Infectious Diseases (USAMRIID, 1969).
 - **National Emerging Infectious Diseases Laboratory (NEIDL, 2017).**
 - **Rocky Mountain Laboratories IRF (RML-NIH, 2008).**





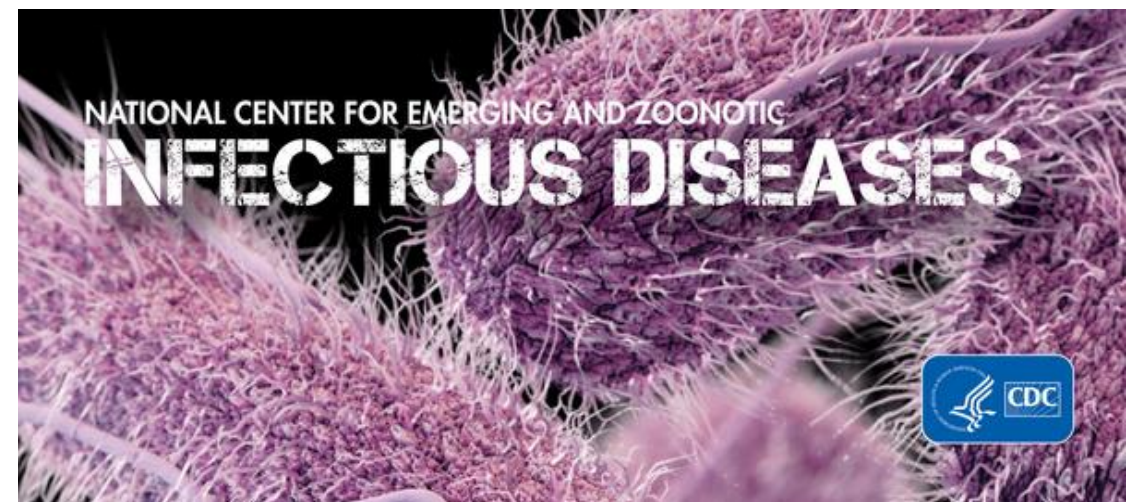
National Centre for Disease Control (NCDC)

- NCDC is responsible for research in **epidemiology**, control of **communicable diseases** & to reorganize activities of Malaria Institute of India (MII) (1909).
- It works under the **Ministry of Health & Family Welfare**.
- NCDC (2009) was originally called Central Malaria Bureau (1909), NI of Communicable Disease (1963).
- It investigated outbreaks of Punjab Pneumonic plague (2002), SARS (2004), Delhi Meningitis (2005), Avian Influenza (2006) & COVID-19.
- NCDC has **8 branches** with headquarters in **New Delhi**.
- It set up **Global Disease Detection** (GDD) regional centre in New Delhi in collaboration with CDC, establishing the Indian Epidemiological Intelligence System (**EIS**) program.
- NCDC has 14 technical centres / divisions.
- **Integrated Disease Surveillance Programme (IDSP, 2004).**
- Centre for AIDS & Related Diseases (CARD).
- **Epidemiology Division.**
- Division of Malariology & Coordination (M&C).
- Helminthology Division.
- Biochemistry & Toxicology.
- Biotechnology Division.
- Microbiology Division.
- Medical Entomology & Vector Management Division (CME&VM).
- Zoonosis Division.
- Division of Parasitic Disease (DPD).
- Centre for Environment & Occupational Health (CE&OH).
- Centre for Non-Communicable Diseases (CNCD).
- **Statistical Monitoring & Evaluation Centre (SM&EC).**

NC for Emerging & Zoonotic Infectious Diseases (NCEZID)



- NCEZID is responsible for protecting people from **domestic & global health threats**.
- Foodborne & waterborne illnesses
- Infections that **spread in hospitals**
- Infections that are **resistant to antibiotics**
- Deadly diseases like Ebola & Anthrax
- Illnesses that affect immigrants, migrants, refugees & travelers.
- Diseases caused by contact with animals
- Diseases spread by mosquitos, ticks & fleas.
- **Emerging**: completely new (Bourbon, MERS), new area (Chikungunya), reappearing (Dengue), antibiotic resistant (MRSA, C. difficile, drug resistant TB).
- **Zoonotic**: Lyme disease (ticks), Salmonella (poultry), Rabies.
- It has **7 divisions** working in US & worldwide.
- D of Foodborne, Waterborne & Environmental Diseases.
- D of Global Migration & Quarantine.
- **D of Healthcare Quality Promotion.**
- D of High-Consequence Pathogens & Pathology.
- **D of Preparedness & Emerging Infections.**
- D of Scientific Resources.
- D of Vector-Borne Diseases.





Ministry of Health & Family Welfare (MoHFW)

- Charged with **health policy & family planning** (1976).
- It regularly publishes **Indian Pharmacopoeia** through IPC.
- MoHFW assisted by World Bank launched **Integrated Disease Surveillance Programme** (IDSP) to detect & respond to outbreaks quickly.
- DoH has launched **14 National Health Programmes**.
- DoFW has **18 Population Research Centres** (PRCs).
- **Department of Health Research** (DHR, 2007).
- **4 Bodies** under **Department of Family Welfare**.
- **Indian Council of Medical Research (ICMR, 1911, New Delhi)**.
- Central Drug Research Institute (CDRI, 1951, Lucknow).
- II of Population Sciences (IIPS, 1956, Mumbai).
- NI of Health & Family Welfare (NIHFW, Delhi).
- **12 bodies** under **Department of Health**.
- All of Hygiene & Public Health (AIH&PH, 1932, Kolkata).
- Indian Nursing Council (1947).
- Dental Council of India (DCI, 1948).
- Pharmacy Council of India (PCI, 1948).
- National Medical Council (NMC, 2020).
- **National Centre for Disease Control (NCDC, 1963)**.
- All of Speech & Hearing (AIISH, 1966, Mysore).
- All of Physical Medicine & Rehabilitation (AIIPMR, Mumbai).
- Hospital Services Consultancy Corporation (HSCC, 1983, Noida).
- Central Drugs Standard Control Organization (CDSCO).
- National AIDS Control Organisation (NACO, 1992).
- Food & Safety Standards Authority of India (FSSAI, 2011, Delhi).



Indian Council of Medical Research (ICMR)

- ICMR is the apex body in India for formulation, coordination & promotion of **biomedical research**.
- ICMR is one of the oldest & largest in the world.
- It researches on control & management of communicable diseases, fertility control, maternal & child health, control of nutritional disorders, alternative strategies for health care, containment of environmental & occupational health problems, research on major non-communicable diseases, mental health research & drug research.
- It established **Clinical Trials Registry India** (CTRI, 2007).
- ICMR promotes **extramural & intramural** research.
- It has **105** Viral Research & Diagnostic Laboratories (VRDL).
- ICMR has **26 research institutes** for specific research.
- It publishes **Indian Journal of Medical Research** monthly.
- NI of Nutrition (NIN, 1918, Hyderabad).
- **NI of Virology (NIV, 1952, Pune).**
- NI for Research in Tuberculosis (NIRT, 1956, Chennai).
- Rajendra Memorial RI of Medical Sciences (RMRIMS, 1963, Patna).
- NI of Research in Reproductive Health (NIRRH, 1970, Mumbai).
- NI of Malaria Research (NIMR, 1977, Delhi).
- N AIDS Research Institute (NARI, 1992, Pune).
- **NI of Epidemiology (NIE, 1999, Chennai).**
- N Animal Resource Facility for Biomedical Research (2015, Hyd.).
- **Microbial Containment Complex (MCC, Pune).**
- **NI of Medical Statistics (NIMS, Delhi).**
- **NC for Disease Informatics & Research (NCDIR, Bengaluru).**
- **NI of Occupational Health (Ahmedabad).**
- **ICMR Virus Unit (Kolkata).**
- ...

All India Institute of Medical Sciences (AIIMS)

- AIIMS are a group of autonomous government **public** medical colleges of **higher education** (1956).
- **15** operating, **8** expected to become operational (2025).
- 8 AIIMS under development in phases.
- AIIMS Madurai (P5).
- AIIMS Darbhanga (P5).
- AIIMS Assam (P5).
- AIIMS Bilaspur (P5).
- AIIMS Jammu (P5).
- AIIMS Kashmir (P5).
- AIIMS Gujrat (P6).
- AIIMS Haryana (P8).
- AIIMS New Delhi (1956).
- AIIMS Bhopal (2012).
- **AIIMS Bhubaneswar (2012).**
- AIIMS Jodhpur (2012).
- AIIMS Patna (2012).
- AIIMS Raipur (2012).
- AIIMS Rishikesh (2012).
- AIIMS Raebareli (2019).
- AIIMS Mangalagiri (2018).
- AIIMS Nagpur (2018).
- AIIMS Gorakhpur (2019).
- AIIMS Bathinda (2019).
- **AIIMS Bibinagar (2019).**
- AIIMS Kalyani (2019).
- AIIMS Deoghar (2019).



Medical Associations:

Indian Medical Association (1928)
Indian Orthopaedic Association (1955).
Indian Academy of Pediatrics (1963)
Academy of Family Physicians of India (2010)

Health Professionals

- **Mental Health:** Psychiatrists (assistant, nurse), Clinical psychologist, Occupational/marriage-family therapist, Clinical social worker, Counselor.
- **Maternal & Newborn Health:** Obstetrician (nurse), Midwife, Physician (assistant).
- **Geriatric Care:** Geriatrician (nurse, care manager, aide), Occupational therapist, Physician (assistant), Adult-Gerontology nurse, Clinical nurse, Pharmacist, Caregiver.
- **Surgery:** Surgeon (assistant, nurse, technologist), Physician (assistant), Anesthesiologist (assistant, nurse, technician), Clinical officer, Operative (nurse).
- **Rehabilitation Care:** Physiatrist, Physician (assistant), Rehabilitation (counsellor, nurse), Clinical nurse, Physiotherapist (technician), Chiropractor, Orthotist (technician), Prosthetist (technician), Respiratory/Occupational/Recreational/Physical therapist, Audiologist, Speech & Language pathologist, Athletic trainer, Personal Care assistant.



- **Eye Care:** Ophthalmologist, Optometrist, Physician assist.
- **Medical Diagnosis:** Radiographer, Radiologist, Sonographer, Medical Laboratory scientist, Pathologist.
- **Oral Care:** Dentist (surgeon, assistant, hygienist, nurse, technician, therapist), Dental auxiliaries, Oral therapist.
- **Foot Care:** Podiatrist (assistant, nurse), Chiropodist, Pedorthist.
- **Public Health:** Medicine specialist, Physician (assistant), Public Health (nurse, dentist), Pharmacist, Clinical nurse specialist, Dietitian, Environmental Health officer, Paramedic, **Epidemiologist**.
- **Alternative Medicine:** Accupuncture, **Ayurveda**, Herbalism, Homeopathy, Naturopathy, Reiki, Siddha medicine, Traditional Chinese medicine, Traditional Korean medicine, Unani, **Yoga**.

Evidence based medicine

Conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.

- **Case report/series:** Few participants w/ similar intervention, and follow up.
- **Case control studies:** Retrospectively looks at participants (past), control group wo/ intervention (early studies, identify variables that predict a condition).
- **Cohort studies:** Follows large group over extended period of time to see how exposures affect outcomes. Used to look at suspected risk factors that cant be controlled experimentally (longitudinal / epidemiological studies).
- **Randomized Controlled Trials (RCT):** Individuals randomly assigned into 2+ groups, with 1 control group that recieves no intervention, a placebo (true experimental design).
- **Meta-analysis:** Statistical summary across multiple studies for finding effect of an intervention.
- **Systematic reviews:** Birds eye view of results of studies side-by-side (highest quality evidence). Cochrane Database of Systematic Reviews, Joanna Briggs Institute EBP Database, Database of Abstracts of Reviews of Effects (DARE).

