

HEALTH INTERVENTIONS BY IEDCR AND IPH

The two national institutions that undertake significant public-health interventions are: the Institute of Epidemiology, Disease Control and Research (IEDCR) and the Institute of Public Health (IPH). This chapter highlights some of the interventions undertaken by these two institutions in 2011.

Institute of Epidemiology, Disease Control and Research

The Institute of Epidemiology, Disease Control and Research (IEDCR), since its inception in 1976, is the national institute responsible for conducting disease surveillance and outbreak investigations. The IEDCR is the WHO-designated National Influenza Centre (NIC) in Bangladesh. With a total staff strength of 115, the IEDCR has eight departments, viz. Biostatistics, Epidemiology, Medical Entomology, Medical Social Science, Microbiology, Parasitology, Virology, and Zoonoses. The specific objectives of IEDCR are: to conduct disease surveillance, outbreak investigation and response, research, and training.

The IEDCR is the WHO-designated National Influenza Centre (NIC) in Bangladesh...

The Institute established a biosafety level 3 (BSL3) laboratory. The other laboratories of the Institute are: Medical Entomology, Microbiology, Parasitology, Virology, Zoonoses, RT-PCR, and BSL 2 Laboratory. The laboratories have wide-ranging diagnostic facilities for testing parasitic and fungal pathogens that cause visceral leishmaniasis (kala-azar, PKDL), malaria, and intestinal diseases, along with dermatophytes and candida; those that cause viral diseases, e.g. Nipah encephalitis, influenza, HAV, HBV, HCV, HEV, HIV, dengue, and chikungunya; bacterial diseases, e.g. enteric fever, brucellosis, rickettsial diseases; and other aerobic and anaerobic bacterial infections. These laboratories also conduct biochemical tests. The IEDCR laboratories have facilities for cell-culture also. The Department of Entomology regularly performs biological efficacy tests for insecticides.

The IEDCR conducted 11 outbreak investigations in 2007, 29 in 2008, 10 in 2009, 17 in 2010, and 22 in 2011 (www.iedcr.org). The outbreak investigations in 2007 were notable for Nipah virus, mass psychogenic illness in 18 districts and toxic *Ghagra shak* outbreak in Sylhet. The 2008 outbreak investigations were notable for Nipah, puffer-fish poisoning, mass psychogenic illness, first human case of avian influenza (AI), and chikungunya. The investigations in 2009 were notable for pandemic influenza A H1N1 (swine flu), chikungunya, cutaneous anthrax, pesticide poisoning, and mass psychogenic illness. Notable outbreaks investigated in 2010 were for Nipah pneumonia, bronchiolitis, chicken pox (in Lama), suspected water contamination (in Barapukuria Power Plant), anthrax (in Tangail, Sirajganj, and Pabna), suspected insecticide poisoning (in Naogaon), mass psychogenic illness and rabies (in Narsingdi).

Investigations for Nipah, cholera and shigellosis outbreaks, detection of the second and third human cases of avian influenza (H5N1), the first case of H9N2, investigation for suspected pesticide poisoning, cutaneous anthrax, suspected rubella encephalitis, hepatitis E, H5 outbreak among ducks and waterfowl (for human contact investigation), influenza B outbreak, respiratory virus cluster, and unknown diseases were the major activities of IEDCR in 2011.

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of IEDCR. Routine and disease-specific surveillance are conducted round the year. The routine surveillances are: Priority Communicable Diseases, Sentinel Surveillance, and Institutional Disease Surveillance. The following are the disease-specific surveillances:

- Event-based surveillance—outbreak investigation and response (28 outbreaks)

- Nipah surveillance
- Acute meningo-encephalitis syndrome surveillance
- Hospital-based influenza surveillance in 12 sites
- National Influenza Surveillance, Bangladesh (NISB) in 14 district hospitals
- Seroprevalence of antibodies to avian influenza A viruses among Bangladeshi workers in poultry markets
- Surveillance for epidemiology of influenza in Bangladesh
- Surveillance for human infections with avian influenza A viruses among workers in live-bird markets and their household members in Dhaka city area
- Community-based avian/human influenza surveillance among poultry workers in H5-infected poultry farms
- High-risk group surveillance in wet markets in Dhaka City Corporation area
- Surveillance for hospital-acquired respiratory infections in patients and healthcare workers in three tertiary-care facilities
- Expansion of web-based disease surveillance from district to upazilla (subdistrict) level
- Salmonella surveillance
- Behavioral risk factor surveillance (BRFS) through telephone interviews
- Hospital-based dengue surveillance.

Web-based disease surveillance

The IEDCR established e-connection with offices of civil surgeons and conducted web-based disease surveillance covering whole of Bangladesh. The IEDCR is preparing to extend the web-based surveillance to the upazilla level. Data-entry will be directly done from upazilla, along with district- and tertiary-level hospitals. Private and NGO health facilities will also participate in this endeavor.

The Institute also provided training and organized workshops in 2011 as follows:

- Workshop on development of SOPs and updating of formats for Integrated Disease Surveillance and Early Warning and Alert System for epidemic-prone diseases
- Workshop on review and updating of strategies and guidelines of integrated disease surveillance

with development of the plan of action

- Collaborative workshop with IANPHI on mentorship and science writing
- Refresher training for physicians on SOPs on avian influenza in humans
- Training of medical technologists on detecting emerging and re-emerging diseases
- Orientation of physicians, nurses, and auxiliary staff on the strategy and guideline for the prevention, control and management of Nipah and other encephalitis
- Advocacy of multisectoral partners for International Health Regulations 2005 (IHR 2005) at all levels, including Points of Entries (PoEs)
- Workshop on development of strategy and guideline for networking among public-health laboratories
- Orientation of journalists on emerging diseases
- Training of Upazilla Rapid Response Team (URRT) members on emerging infectious diseases and outbreak investigation
- Training of physicians of urban health centers on emerging infectious diseases.

Other activities of the IEDCR in 2011 included the following:

- Development of policy, strategies, and guidelines
 - Strategy and guideline for prevention, control, and management of Nipah and other encephalitis
 - Strategy and guideline for networking among public-health laboratories
 - Revised and updated SOP, guideline, and plan of action for IHR 2005
 - SOP for web-based Integrated Disease Surveillance and Early Warning and Alert System for epidemic-prone diseases
 - Guidelines on emerging infectious diseases and outbreak investigations
- Conduction of assessment on Core Alert and Response Capacities in IHR 2005 at all levels
- Review and assessment of national legislation, regulations, and other instruments for IHR 2005 implementation
- Development of new law for implementation of IHR 2005

- Development of IEDCR compendium.

The IEDCR conducted research on the following areas in 2011:

- Assessment of the impact of hepatitis B vaccination in Bangladesh: a seroprevalence study
- Safety and efficacy of Liposomal Amphotericin B (Ambisome) in Bangladeshi patients with visceral leishmaniasis: Phase III clinical trial
- HIV, syphilis, and hepatitis among pregnant women in selected health facilities of Greater Sylhet area of Bangladesh
- National HIV serosurveillance (9th Round)
- Assessment of the vulnerability of population and the health system in Bangladesh to the impacts of climate change
- Effectiveness of prevention campaign on *Ghagra shak* poisoning in Sylhet: A post-test only intervention control study
- Mitigating the impact of climate change to reduce the burden of climate sensitive illnesses
- Assessing prevalence and risk factors of mild/asymptomatic H5N1 infections among persons exposed to H5N1-infected poultry

- Estimate the risk of mild human infection among persons exposed to H5N1-infected poultry.

The IEDCR is a member of International Association of National Public Health Institutes (IANPHI), Global Outbreak Alert Response Network (GOARN). Director of IEDCR is a member of the Executive Board of IANPHI. The IEDCR has collaborative activities with the Centers for Disease Control and Prevention (CDC) of USA, Rockefeller Foundation, icddr,b, IANPHI. The IEDCR is supported by WHO, UNICEF, FAO, USAID, and other UN and international agencies.

Institute of Public Health

The Institute of Public Health (IPH), established in 1953, is responsible for the quality control of drugs dispensed in the country and ensuring the quality of food and water; production of vaccines, intravenous fluids, anti-sera and diagnostic reagents; diagnosis of infectious diseases. Research on the above disciplines is also conducted by the IPH. The activities are performed in different units of five major sections.

Table 14.1 shows the quantity of different types of intravenous fluids produced by IPH from 2002 to 2011.

Table 14.1. Production of intravenous fluids by IPH (2002 to 2011)

Item	Pack-size (mL)	2002	2003	2003	2004	2005	2006	2007	2008	2009	2010	2011
Glucose saline	1,000	66,780	39,735	80,904	81,238	81,238	6,754	13,242	130,799	107,724	87,040	70,700
	500	3,497	243,610	241,043	221,026	221,026	285,145	217,758	110,179	180,489	1,39,630	1,43,225
Glucose aqua	1,000	56,055	42,569	84,455	72,429	72,429	7,823	11,325	134,416	86,243	85,894	66,225
	500	333,213	248,265	233,086	211,607	211,607	277,329	204,345	110,006	154,894	1,25,044	1,20,235
Normal saline	1,000	9,291	17,662	9,783	17,930	17,930	5,029	-	-	50,978	64,471	51,078
	500	77,319	68,492	50,536	52,518	52,518	58,338	67,831	54,379	91,854	93,291	1,01,394
Cholera saline	1,000	118,519	129,986	192,907	10,409	10,409	1,627	25,304	108,521	80,665	67,440	56,367
	500	308,536	246,718	472,545	280,402	280,402	182,789	240,473	69,401	135,443	1,21,350	1,07,320
P.D. fluid	1,000	93,384	57,657	68,421	53,666	53,666	61,391	38,109	52,481	46,085	30,110	21,192
	500	20,278	-	-	-	-	-	10,291	3,640	-	-	-
3% Normal saline	1,000	-	-	-	-	-	-	-	-	-	-	-
	500	5,022	5,107	4,578	6,888	6,888	6,939	8,456	7,700	10,674	7,740	11,130
Baby saline	1,000	-	-	-	-	-	11,000	12,600	-	-	-	-
	500	6,717	4,689	14,307	8,245	8,245	500	-	-	26,120	21,560	30,475
Hemo dialysis fluid	1,000	33,510	14,200	21,100	20,650	20,650	1,000	-	10,500	12,600	8,150	7,830
	-	-	-	-	-	500	8,700	18,680	-	-	-	-
Hartman's Solution	1,000	-	-	-	-	-	1,000	-	-	-	-	-
	500	31,694	42,710	47,520	70,676	70,676	500	21,014	97,752	144,943	124,040	1,10,305

Table 14.2 shows the quantity of blood-bags and related accessories produced by IPH from 2002 to 2011.

Table 14.3 shows the quantity of anti-rabies vaccines produced by IPH from 2006 to 2011.

Table 14.4 shows the quantity of different types of diagnostic reagents produced by IPH from 2001 to 2011.

Figure 14.1 shows the quantity of oral rehydration salt (ORS) produced and distributed by IPH from 2001 to 2011

Table 14.2. Production of blood-bags and accessories by IPH (2002 to 2011)

Item	Pack-type	2002	2003	2003	2004	2005	2006	2007	2008	2009	2010	2011
CPD blood-bag	Single	101,844	107,437	87,586	59,827	59,827	65,936	74,435	55,060	85,800	83,890	62,272
Baby bag	150 mL	-	150	-	-	-	-	-	-	-	-	1400
Transfusion set	-	37,060	15,650	51,775	34,775	34,775	31,860	24,060	7,925	-	-	3,800
Infusion set	-	130,200	107,350	190,300	188,750	188,750	86,710	42,200	30,400	-	-	10,200

Table 14.3. Production of anti-rabies vaccine by IPH (2006 to 2011)

Year	For humans (5 mL)			For animals (10 mL)		
	mL	Ampoule	Course	mL	Ampoule	Course
2006	2,730,400	546,080	39,005	418,600	41,860	996
2007	2,446,900	489,380	34,955	483,750	48,375	1,166
2008	3,017,125	2,848,440	83,793	619,620	51,990	15,570
2009	2,895,500	579,100	41,365	543,800	54,380	1,295
2010	2,296,100	459,220	32,802	324,500	32,450	773
2011	1,296,370	259,274	18,519	368,300	36,830	877

Table 14.4. Production of diagnostic reagents by IPH (2001 to 2011)

Item	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Benedict's Solution (L)	420	600	555	470	460	294	480	560	457	460	360
ESR fluid (L)	60	160	160	150	160	110	237	380	155	160	89
20% Sulfuric acid solution (L)	40	40	95	95	30	-	20	40	-	30	NIL
N/10 Hydrochloric acid solution (L)	70	60	90	10	60	70	80	190	60	50	41
Acetone alcohol (L)	NIL	NIL	55	20	10	-	10	-	25	NIL	NIL

Table 14.4 Continued

Item	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
5% Acetic acid solution (L)	60	60	80	100	60	20	70	170	80	40	10
WBC fluid (L)	60	50	80	40	60	20	40	100	70	100	NIL
RBC fluid (L)	20	50	80	70	30	-	20	80	-	30	NIL
30% Suplhosalicic acid (L)	10	Nil	Nil	10	11.6	-	10	07	-	04	NIL
20% Sodium hydroxide solution (L)	Nil	Nil	Nil	20	Nil	-	-	-	-	NIL	NIL
20% Potassium hydroxide solution (L)	Nil	02	11.5	Nil	Nil	-	-	-	-	NIL	NIL
Semen analysis fluid (L)	20	Nil	36.5	20	10	-	05	-	-	NIL	10
Normal saline (L)	60	100	90	70	40	30	80	60	90	20	NIL
Methylene blue (L)	20	35	57	30	10	10	05	25	20	05	NIL
Crystal violet (L)	15	15	30	10	10	-	-	05	27	05	NIL
Basic fuchsin (L)	05	10	33	10	05	32	-	22	5	NIL	NIL
Carbol fuchsin (L)	22	22	66	44	11	10	-	-	22	NIL	NIL
Gram iodine (L)	10.5	05	35	10	05	05	10	-	20	NIL	5
Lugol's iodine (L)	15.5	20	40	15	15	15	16	40	50	05	15
Leishman stain (L)	44	96	69	47	62	29	65.1	104	61.8	43	49.6
Giemsa stain (L)	29	48	39.5	Nil	36	16	51.8	60	71.9	34	43
Glucose kits	100	47	78	100	48	98	-	100	100	NIL	48
Bilirubin kits	62	6	152	97	Nil	99	44	151	96	97	NIL
Creatinine kits	Nil	Nil	54	51	Nil	-	-	69	47	49	250
Uric Acid kits	Nil	Nil	27	60	Nil	-	-	-	-	NIL	NIL
EDTA vials	Nil	Nil	Nil	Nil	Nil	500	-	-	511	NIL	NIL
Urea kits											48

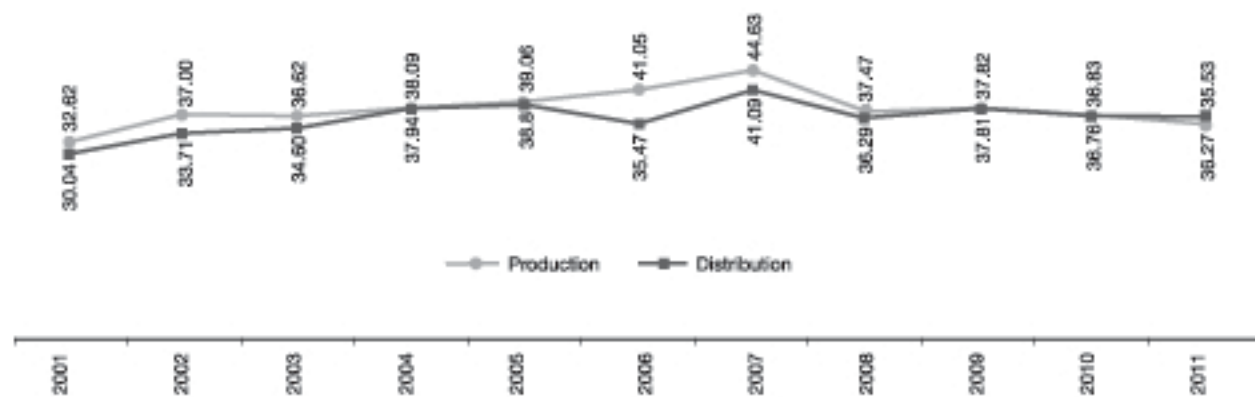


Figure 14.1. Production and distribution of oral rehydration salt (ORS) (million packet) by IPH (2001 to 2011)

Table 14.5 shows the number of food samples tested by IPH from 2001 to 2011. The table also shows the distribution of the genuine and adulterated samples out of the total samples tested each year.

Figure 14.2 shows the number of water samples tested by chemical means by IPH during 2001-2011 and

distribution of satisfactory and unsatisfactory samples each year.

Figure 14.3 shows the number of water-samples for which bacteriological test has been done by IPH during 2001-2011 and distribution of satisfactory and unsatisfactory samples in each year.

Table 14.5. Food samples tested by year (2001-2011)

Year	Total samples	Genuine		Adulterated	
		No.	%	No.	%
2001	3,280	1,692	51.6%	1,588	48.4%
2002	4,300	2,110	49.0%	2,190	51.0%
2003	5,120	2,515	49.1%	2,605	50.9%
2004	4,413	2,214	52.0%	2,119	48.0%
2005	6,337	3,200	50.5%	3,137	49.5%
2006	2,779	1,405	50.6%	1,374	49.4%
2007	5,992	3,488	58.2%	2,504	41.8%
2008	8,734	5,066	58.0%	3,668	42.0%
2009	6,338	3,356	52.9%	2,982	47.1%
2010	5,749	2,759	48%	2,990	52%
2011	5,812	2,671	45.96%	3,147	54.04%

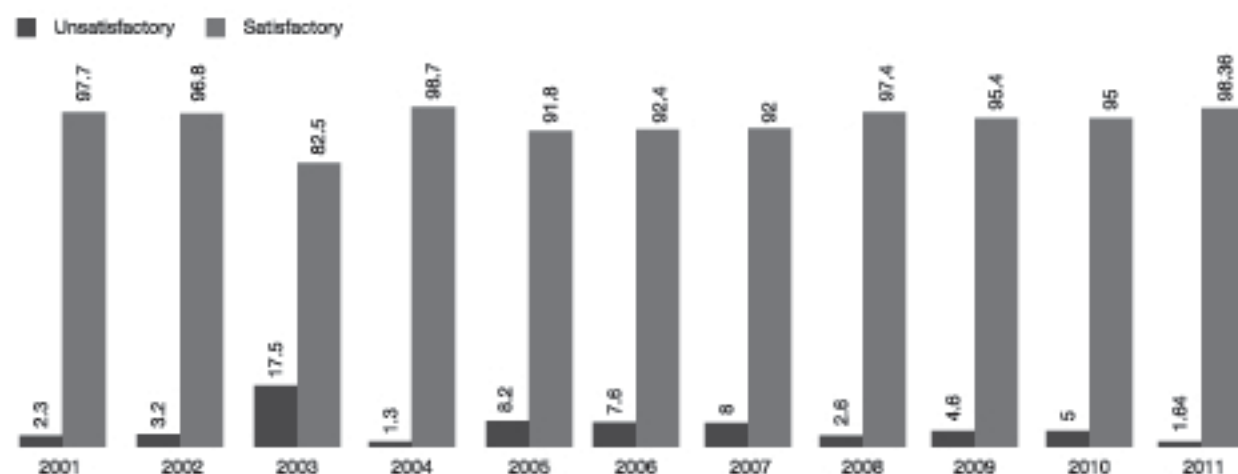


Figure 14.2. Number of water-samples tested chemically by IPH from 2001 to 2011 and distribution of satisfactory and unsatisfactory tests each year

Table 14.6 shows the number of drug samples received by IPH and their test results from 2001 to 2011.

The National Polio Laboratory of IPH is a WHO-accredited laboratory established to assist the

eradication of wild polio virus from the country. It is a partner of SEARO-WHO Polio Network.

Table 14.7 shows the number of stool samples tested by IPH for polio virus from 2001 to 2011 and the results of the tests.

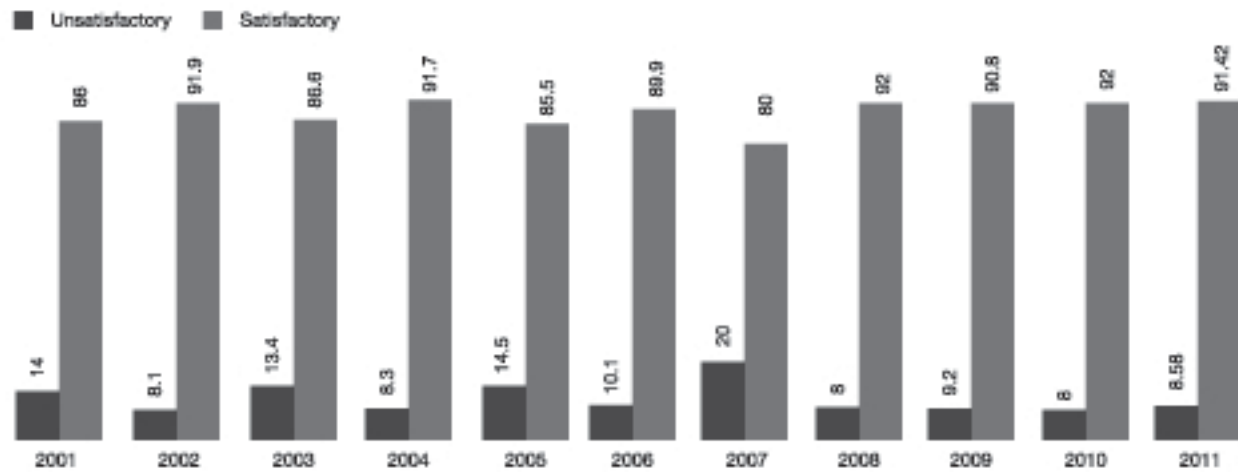


Figure 14.3. Number of water-samples tested bacteriologically by IPH from 2001 to 2011 and distribution of satisfactory and unsatisfactory samples

Table 14.6. Number of drug samples tested by IPH and their results (2001 to 2011)

Year	Samples received (N)	Satisfactory (N)	Unsatisfactory (N)	Not analyzed	Feedback given to senders
2001	3,625	3,533	30	0	62
2002	3,159	3,017	26	0	113
2003	3,842	3,763	28	0	51
2004	3,719	3,641	45	0	33
2005	3,472	3,056	89	127	200
2006	2,708	2,664	44	-	-
2007	3,097	2,978	119	-	-
2008	4,589	3,639	100	-	-
2009	3,145	3,078	67	-	-
2010	5,006	3,833	82	1,091	-
2011	3,720	2,583	104	1,033	-

Table 14.7. Number of stool samples tested by IPH for polio virus from 2001 to 2011 and their results

Item	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
AFP cases (N)	1,287	1,365	1,128	1,301	1,458	1,619	1,844	1,809	1,522	1,541	1,600
Samples (N)	2,728	2,931	2,388	2,631	2,910	3,185	3,611	4,356	3,483	3,464	3,619
Polio virus isolates (N)	74	93	91	118	59	253	181	80	56	72	75
Wild polio viruses (N)	-	-	-	-	-	18	-	-	-	-	-
Vaccine (Sabin) viruses (N)	74	93	91	118	59	187	193	76	56	72	75
NPEV (Non-polio enteroviruses) (N)	804	815	565	517	574	473	553	1,012	684	645	638
Negative samples (N)	1,850	2,023	1,732	1,996	2,277	2,492	2,910	3,264	2,743	2,746	2,906
Total (N)	6,817	7,320	5,995	6,681	7,337	8,227	9,292	10,597	8,544	8,540	8,913

The Measles Laboratory of IPH is involved with the serological study of measles and rubella to support measles control program in the country. Table 14.8 shows the numbers of measles-positive, rubella-positive and negative blood-samples tested by the Measles Laboratory of the Institute from 2003 to 2011.

Table 14.8. Number of measles-positive, rubella-positive (IgM antibody) and total negative blood samples (both measles and rubella) tested by the Measles Laboratory of IPH from 2003 to 2011

Test result	2003	2004	2005	2006	2007	2008	2009	2010	2011
Measles-positive	59	404	769	170	6	16	35	51	1,788
Rubella-positive	-	55	609	164	432	243	1,133	1,425	672
Total negative	12	157	453	77	149	529	769	817	1,633
Total samples	71	616	1,831	411	587	788	1,937	2,293	4,093

The IPH also performs routine tests on blood, serum, stool, urine, sputum, throat-swab, ear-swab, etc. Table 14.9 shows a summary of the tests done by the Institute from 2001 to 2011.

Table 14.9. Number of routine tests done by IPH from 2001 to 2011

Test	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Biochemical (blood)	189	182	176	45	-	-	-	-	-	-	-
Serological	-	70	19	871	3,333	923	2,051	3,293	-	-	11,043
Routine examination (stool, blood-CP, urine, sputum)	970	840	395	456	341	192	133	123	82	162	157
Culture and sensitivity (stool, blood, urine, sputum, throat-swab, ear-swab)	222	231	381	146	121	161	108	98	78	30	-

The IPH is a designated site for field visit by medical students in the country. Undergraduate medical and dental students from almost all medical colleges come to see the activities of IPH for learning. Figure 14.4 shows the number of medical/dental students who visited IPH during 2001 to 2011).

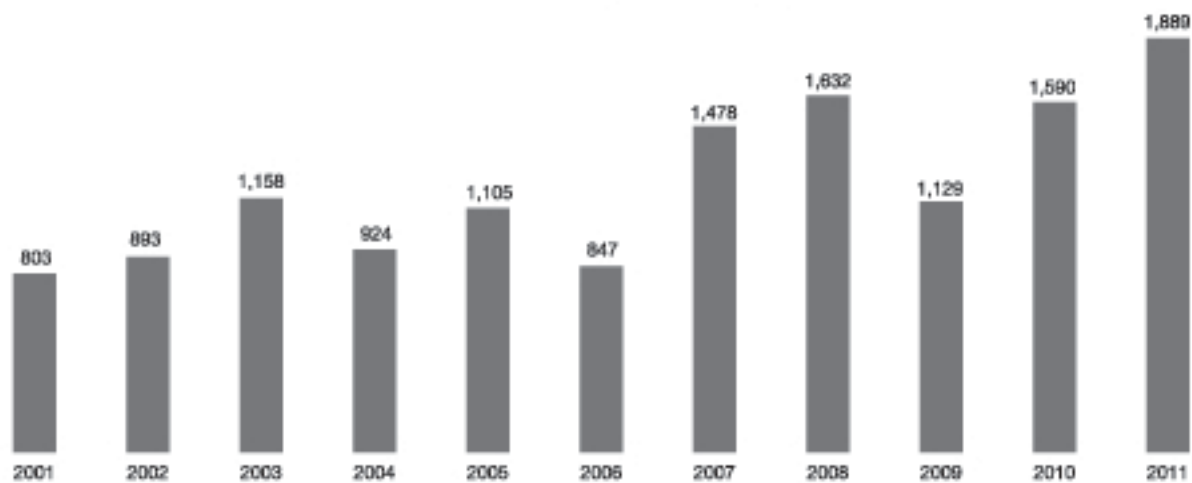


Figure 14.4. Number of medical and dental students visiting IPH for field visit (2001 to 2011)

The IPH also provides training to develop human resources. Table 14.10 shows a snapshot of the training programs and number of participants in different training programs organized during 2008-2011.

Table 14.10. Training provided by IPH to develop human resources (2008-2011)

Field of training	Duration (days)	2008				2009				2010				2011			
		Class				Class				Class				Class			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Computer (Basic)	28	40	55	220	-	11	5	19	-	27	8	33	-	-	8	33	-
Computer (Refresher)	14	-	25	50	-	27	19	161	-	30	39	153	-	-	39	153	-
Computer (Advanced)	28	-	-	-	-	-	3	29	-	5	13	44	-	-	13	44	-
Good Laboratory Practice	10	-	50	140	-	-	-	-	-	-	-	-	-	-	-	-	-
Good Laboratory Practice	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Good Laboratory Practice	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Good Laboratory Practice	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Good Laboratory Practice	5	-	-	-	240	-	-	-	-	-	-	-	-	-	-	-	-
Security Management	5	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-
English Language	28	40	51	-	-	21	-	-	-	21	-	-	-	-	-	-	-