



中国疾病预防控制中心

CHINESE INFORMATION SYSTEM FOR
INFECTIOUS DISEASES CONTROL AND PREVENTION

传染病监测信息系统

中国疾病预防控制中心 公共卫生监测与信息服务中心
Center for Public Health
Surveillance and Information Services, China CDC

前

言

PREFACE

2003年，一场突如其来的SARS疫情灾难，暴露出我国公共卫生信息系统发展滞后，信息不通、决策迟缓、指挥不灵等薄弱环节。党中央、国务院及时提出要加强传染病与突发公共卫生事件网络系统建设，完善突发公共卫生应急反应机制，提高疫情报告的及时性、准确性和应急反应的敏感性。卫生部要求中国疾病预防控制中心，尽快制订国家传染病和突发公共卫生事件网络直报信息系统建设方案。中国疾病预防控制中心在卫生部的直接领导下，在详细全面业务需求分析基础上，建立综合疾病监测信息模型、功能模型和数据模型，通过对疫情报告业务流程重组和改造，建立了以传染病疫情和突发公共卫生事件个案数据库为核心的全新业务模式；完成了适合多层次，多部门专业用户的软件应用开发和技术整合；利用信息安全技术在互联网上构建虚拟专用网络(VPN)；利用高性能计算、海量存储和快速统计方法，实现大用户量并发网络应用要求，极大地改善了基层基础网络环境，提高了基层计算机的应用水平与监测能力。

In 2003, a precipitate disaster—SARS attacked us, and it exposed our weaknesses, such as the backward development of the public health, the distempered system in handling with public health emergencies. The CPC Central Committee and the State Department request to strengthen the construction of infectious diseases and public health emergencies system, with focus on promoting the timeliness, sensitivity and accuracy of report. As request by Ministry of Health (MOH), Center for Disease Control and Prevention (CDC) should make the construction project as soon as possible. Under the lead of MOH, based on the detail and comprehensive analysis of operation demand, a new operation model has been established based on infectious disease individual cases and public health emergencies, which has recombined and revised the working flow of epidemic report and established a comprehensive disease surveillance information model, functional model and data model. And it has completed the application software development and technology integration satisfying multi levels and multi users among different departments. A Virtual Private Network (VPN) has been constructed using the information safety technology. The internet report system can satisfy amount of users at the same time though the application of high performance of calculation, large memory and fast statistic method; besides, the local internet circumstance has been improved increasingly; the capability of computer application and disease surveillance has been enhanced.

传染病监测与报告的演变过程

Development of Surveillance & Reporting for Notifiable Infectious Diseases

2004~

网络为基础的，实时的，个案直报系统，覆盖37种法定传染病
Web-based, real-time, daily case reporting, data sharing between central & local level, and covered 37 notifiable infectious diseases

1985~2003

每月以电子统计报表的形式由县区、地市、省、国家逐级报告
county-based monthly report by electronic files

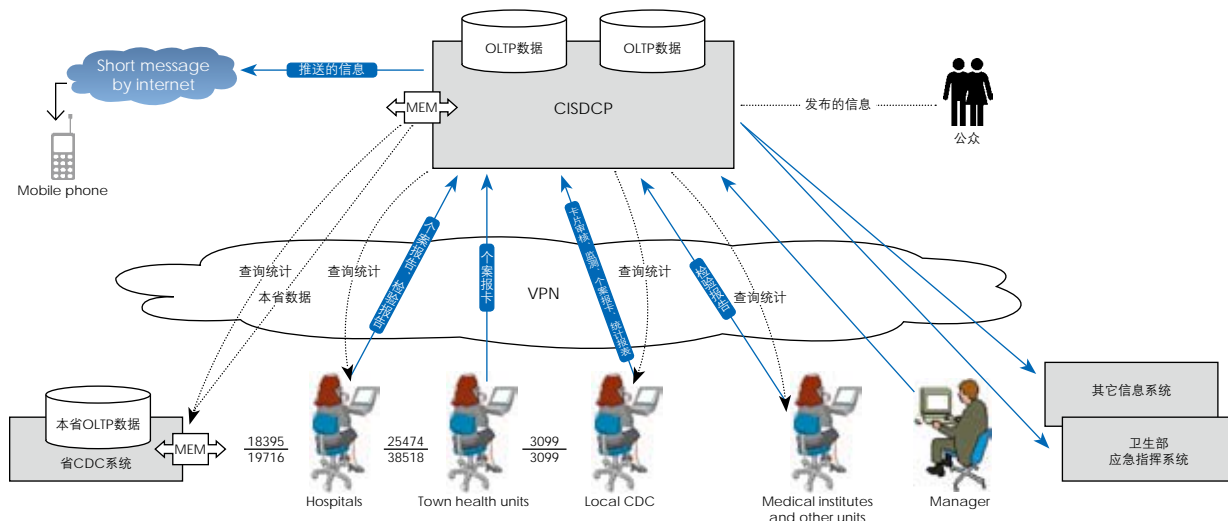
1950~1985

每月以纸质统计报表的形式由县区、地市、省、国家逐级报告
county-based monthly report by paper with mailing system

网络直报工作机制(由地方直接至中央)

Working Procedure of the Web-based Reporting System

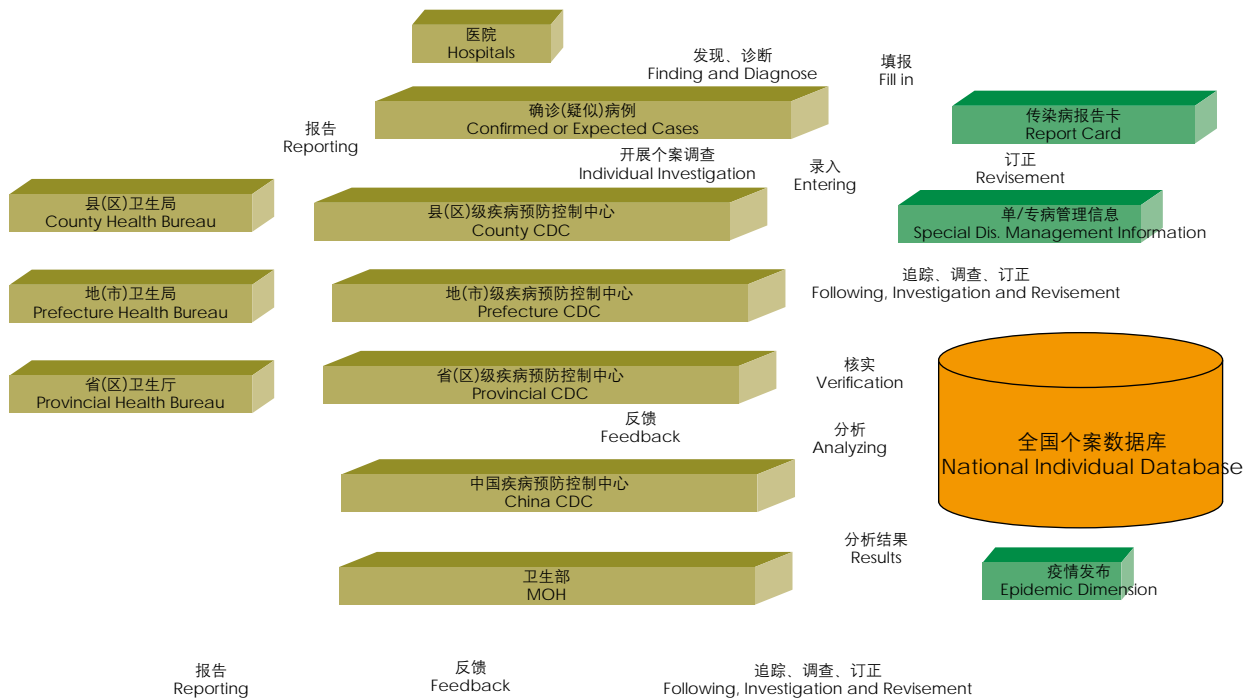
- 约47000医疗机构具备网络直报能力;
About 47000 medical units have the ability of using the system;
- 每天约有5000用户;
About 5000 users every day;
- 每天报告12000例病例;
Approximately 12,000 cases are reported everyday;
- 2005年共报告4428548例病例。
4428548 cases in 2005.



法定传染病信息报告反馈流程

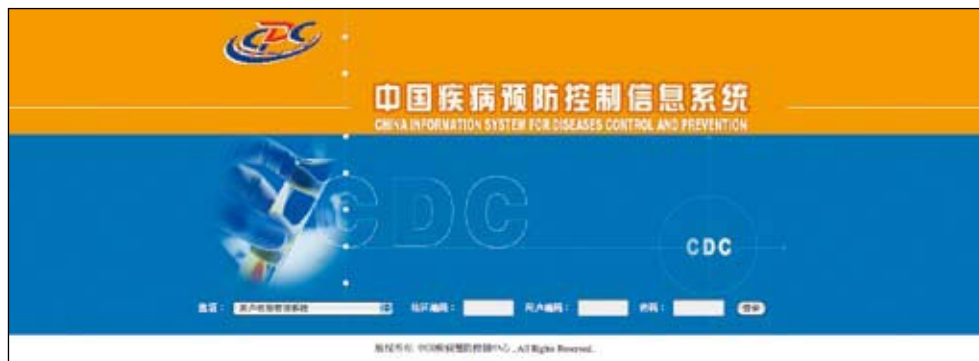
The Flow of Information Reporting and Feedback for Notifiable infectious diseases

传染病监测个案信息通过网络直接报告至中国疾病预防控制中心的数据中心，但管理分级，分国家级、省级、地市级、县级和乡镇级。各级疾病预防控制中心与同级的卫生行政部门进行信息的通报与反馈。The surveillance information is reported to the national database directly through the internet. However, the management is classified, national, provincial, prefecture and county level included in the system. The center for disease control and prevention make information communication and feedback with health authority department at every level.



系统于2004年1月1日开始启用

The system was put into use in Jan. 1, 2004



我国法定传染病报告病种 (37种)

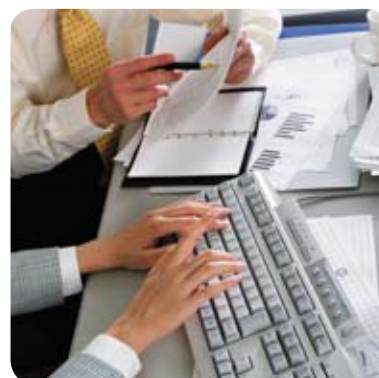
Notifiable infectious diseases

甲类(2) Group A	鼠疫、霍乱 Plague, Cholera
乙类(25) Group B	传染性非典型肺炎、艾滋病、病毒性肝炎、脊髓灰质炎、人感染高致病性禽流感、麻疹、流行性出血热、狂犬病、流行性乙型脑炎、登革热、炭疽、细菌性和阿米巴性痢疾、肺结核、伤寒和副伤寒、流行性脑脊髓膜炎、百日咳、白喉、新生儿破伤风、猩红热、布鲁氏菌病、淋病、梅毒、钩端螺旋体病、血吸虫病、疟疾 SARS, AIDS, Viral hepatitis, Poliomyelitis, HPAI, Measles, HFRS, Rabies, Japanese encephalitis, Dengue fever, Anthrax, Bacillary & amebic dysentery, TB, typhoid fever/Paratyphoid fever, Meningococcal Meningitis, Pertussis, Diphtheria, Neonatal Tetanus, Scarlet fever, Brucellosis, Gonorrhoea, Syphilis, Leptospirosis, Schistosomiasis, Malaria
丙类(10) Group C	流行性感、流行性腮腺炎、风疹、急性出血性结膜炎、麻风病、流行性和地方性斑疹伤寒、黑热病、包虫病、丝虫病、除霍乱、细菌性和阿米巴性痢疾、伤寒和副伤寒以外的感染性腹泻病。 Influenza, Mumps, Rubella, Acute hemorrhagic Conjunctivitis, Leprosy, Epidemic typhus/Endemic typhus, kala-azar, Echinococcosis, Filariasis, Infectious diarrhea

传染病监测的基本原则

Principles of Infectious Dis. Surveillance

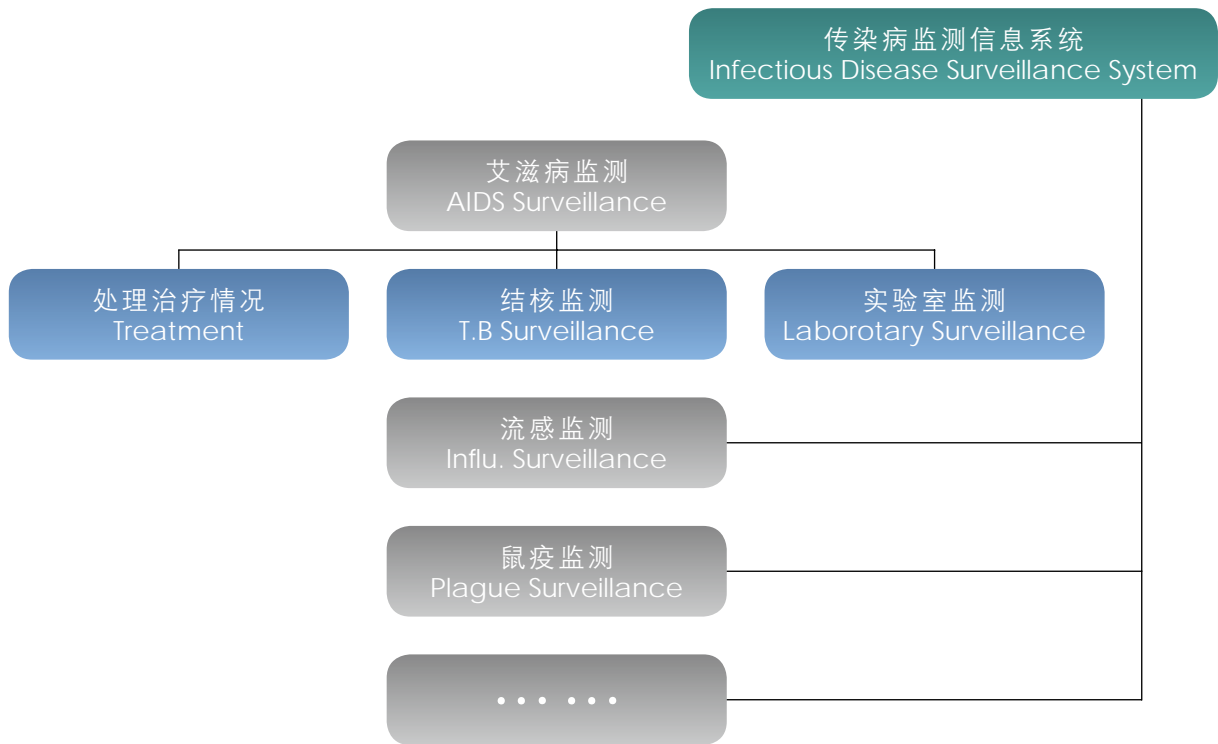
- 每日观察与报告异常事件
Continuous watchfulness and reporting the unusual events everyday
- 疫情在第一时间被报至国家
Directly reported to the central when the epidemic happens
- 国家CDC相关部门开展监测、调查、核实与危险评估
Surveillance, Investigation, validation and risk assessment are carried out in several department of National CDC



统一监测信息系统平台

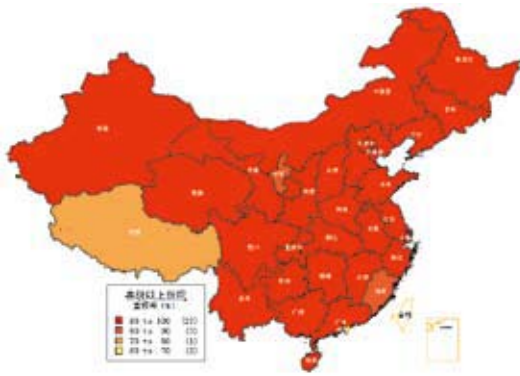
The Uniform Surveillance Information Platform

- 已经上线运行系统
Running Systems Since 2004
- 传染病报告信息系统
Infectious Disease Reporting System
- 突发公共卫生事件报告系统
Emergency Event on Public Health Reporting System
- 专病管理系统
Specific Infectious Disease Management Information System
 - > 艾滋病 HIV/AIDS
 - > 肺结核 Tuberculosis
 - > 鼠疫 Plague
 - > 流感/禽流感监测系统 Flu/Avian Flu Surveillance Information System
 - >
- 医院死亡病例报告系统
Hospital-based Death Cases Reporting System
- 健康危险因素报告系统
Health Risk Factors Reporting System (air, water, food,...)
- 疾病预防控制基本信息系统
Basic Information System for Disease Control and Prevention

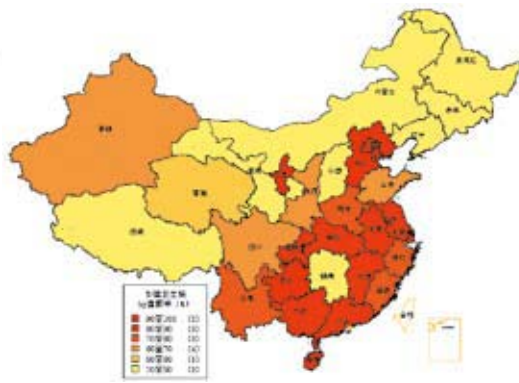


应用情况

Application Status



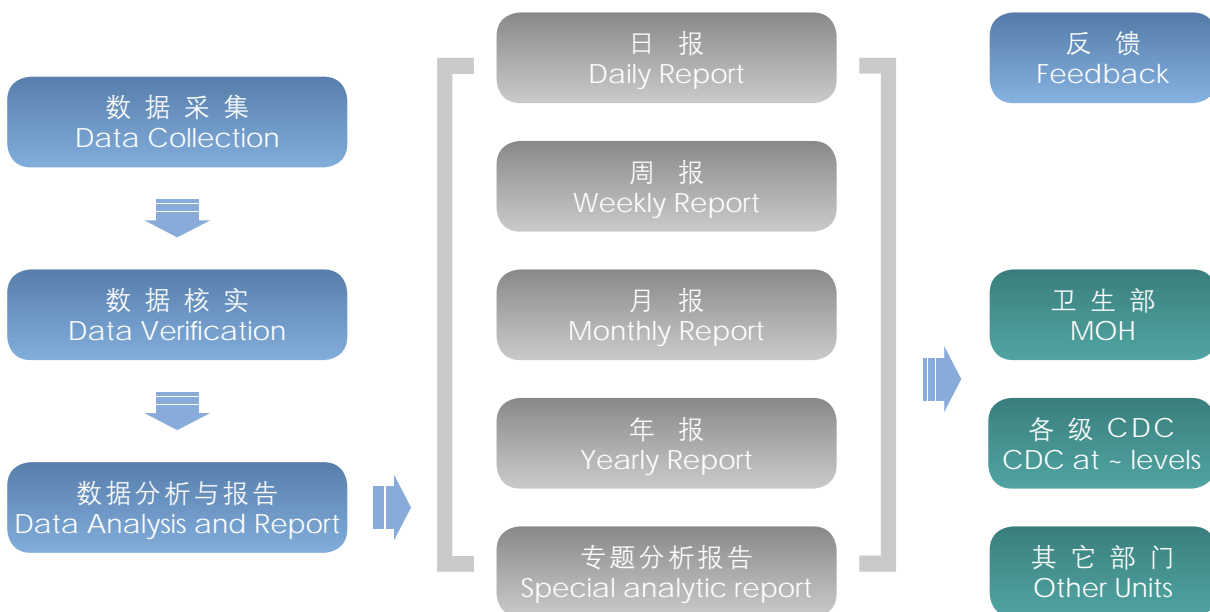
2005年县及以上医疗机构网络直报覆盖率：93.3%
System Coverage: 93.3%
medical units at county and above level, 2005



2005年乡镇医疗机构网络直报覆盖率：66.1% (14个省>80%)
System Coverage: 66.1%
medical units at township level, 2005 (over 80% in 14 provinces)

疾病监测信息管理的工作模式

Working Model of disease surveillance



网络直报系统功能

Main Functions



传染病报告信息采集
Reporting card



传染病个案信息管理
Data Manage for Cases of Infectious Dis



统计分析
Reporting card



日报
Daily Report



周报
Weekly Report

动态监测信息反馈
Information feed backing

疫情信息的及时上情下达与下情上达提高了疫情的透明度，有利于社会稳定；有利于对外交往，提高了我国在公共卫生方面的国际声誉。

The timely transition of epidemic situation between national and local level promotes the transparency in reporting the epidemic than before, which would be benefic to the social stability and the communication with the foreign, promoting our international credit in the public health field.



日报
Daily Report



周报
Weekly Report



专题分析报告
Special analytical report

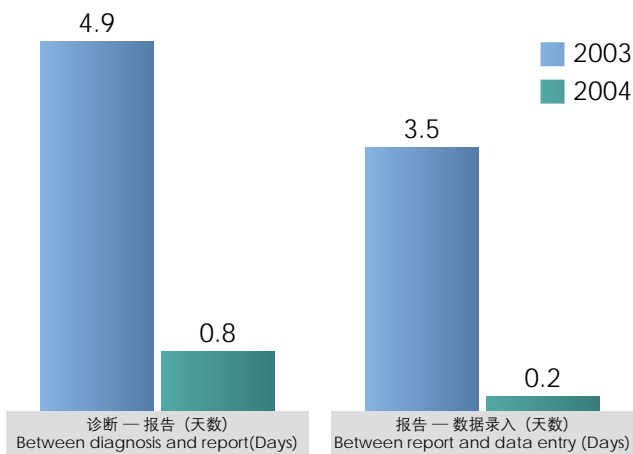
分析报告
Analytical report

系统的主要优势

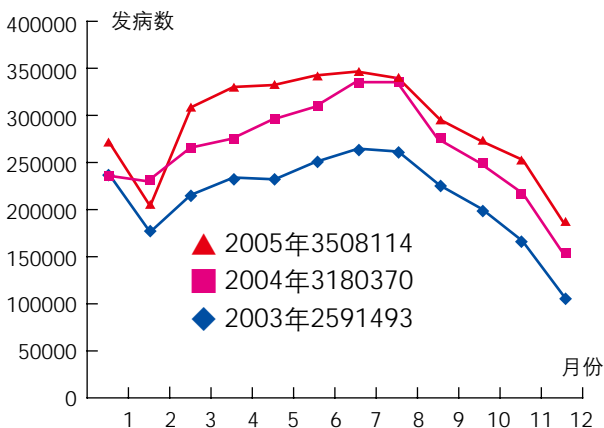
Major Advantages of the system

- 提高了传染病报告的及时性;
Improving the timeliness of report;
- 提高了监测资料的完整性和准确性;
Improving the completeness and accuracy of surveillance data;
- 提高了传染病暴发的早期察觉能力;
Improving the ability of outbreak early detection;
- 通过不明原因肺炎指示病例, 提高了新发传染病早期识别的能力。
Improving the ability of the emerging diseases detection according to the indicator cases, such as pneumonia with unknown pathogen.

传染病报告的及时性得到较大提高
More quickly report of infectious dis. case

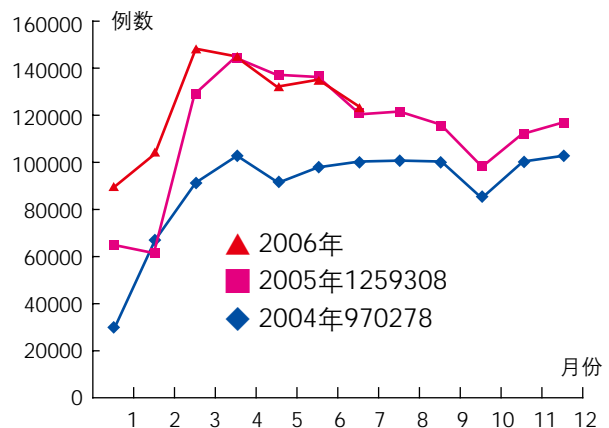


报告病例数大幅度提高, 传染病漏报减少
A large increase in the number of reported cases, underreporting cases decreased



促进了结核病发现
Finding more TB patients

网络直报提高了结核病的发现率, 提前实现了我国与世界卫生组织承诺的目标; 同时也进一步改善了对HIV(艾滋病毒)携带者的追踪和信息管理能力;
The real-time internet reporting model of infectious diseases increases the finding of Tuberculosis, realizing the promise to WHO in advance. Besides, this also improves the capability of following up and management for HIV carrier.

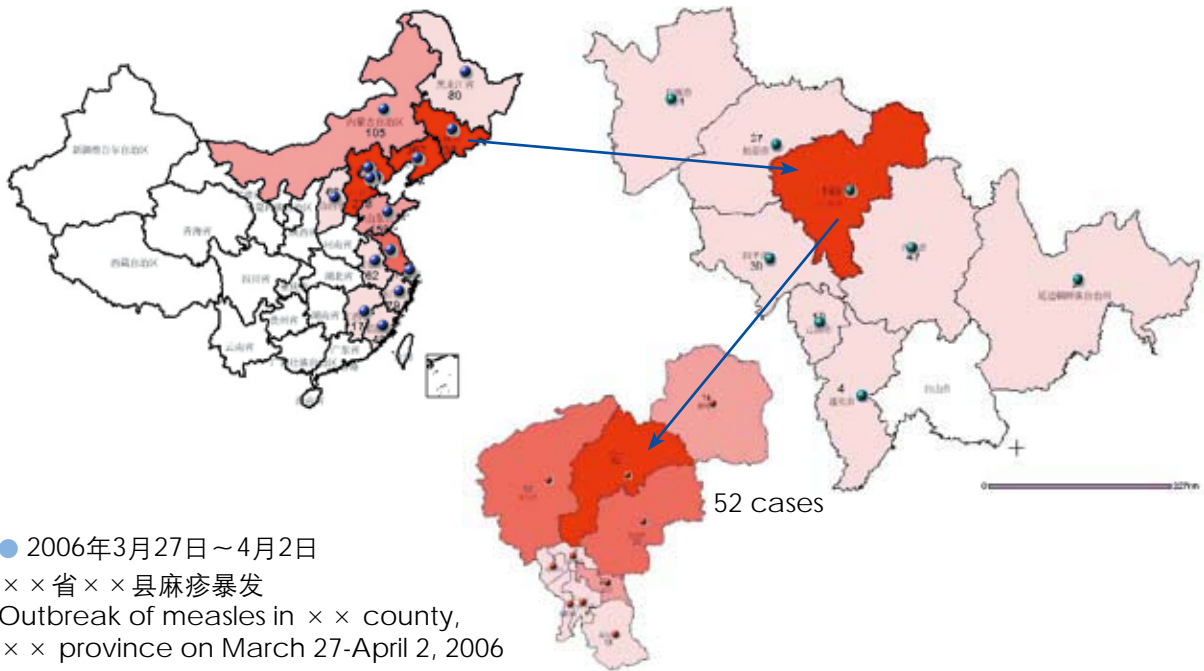


应用示例：××县麻疹暴发的探测

Example: Detection of Measles Outbreak in ×× County

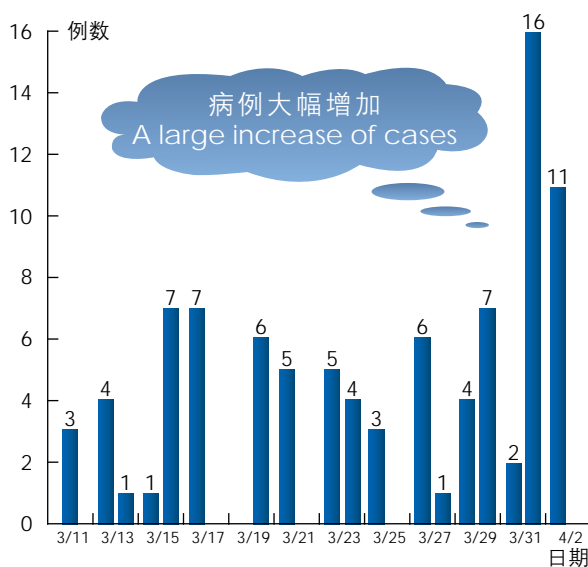
■ 通过GIS观察病例聚集性发现传染病暴发

Outbreak detection via observing cluster of cases by GIS



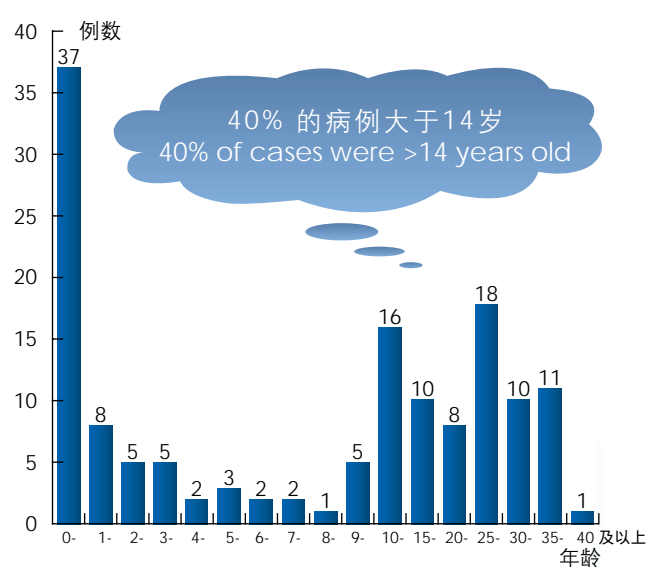
● 2006年3月11日~4月2日
××县麻疹病例发病时间分布

Time distribution of measles in ×× on March
11-April 2, 2006



● 2006年3月11日~4月2日
××县麻疹病例年龄分布

Age Distribution of measles in ×× on March
11-April 2, 2006



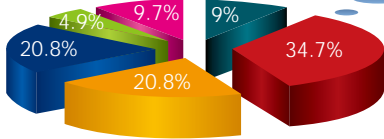
● 2006年3月11日~4月2日

× × 县麻疹病例职业分布

Occupation distribution of measles in × × on March 11-April 2, 2006

- 幼托儿童
- 散居儿童
- 学生
- 农民
- 家务及待业
- 其它

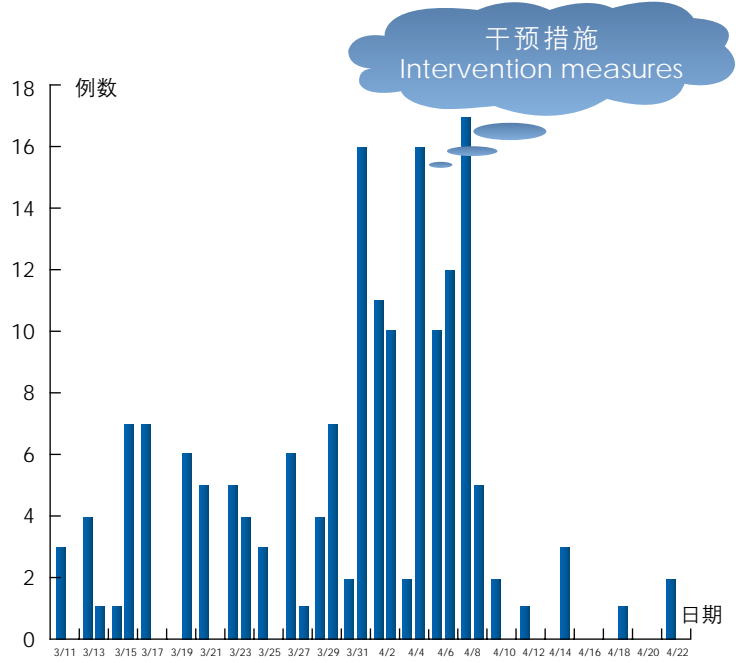
34.7%的病例为学龄前儿童
34.7% of cases belonged to pre-school-age children



● 2006年3月11日~4月22日

× × 县采取干预措施后麻疹病例数的减少

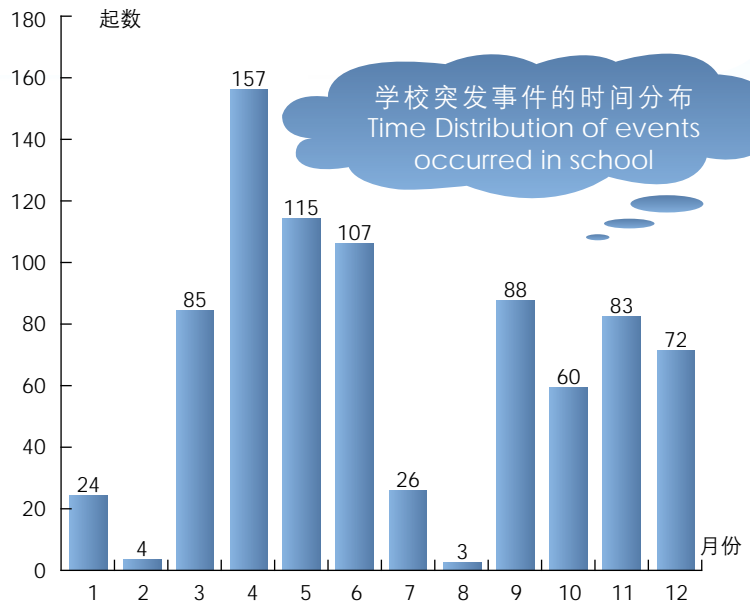
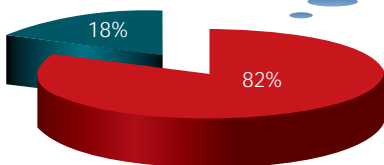
Decrease in measles after measures taken in × × on March 11-April 22, 2006



动态监测全国各地突发公共卫生事件报告

National Surveillance of Public Health Emergency

82% (824/1005) 发生在学校
Location: 82% (824/1005) occurred in school

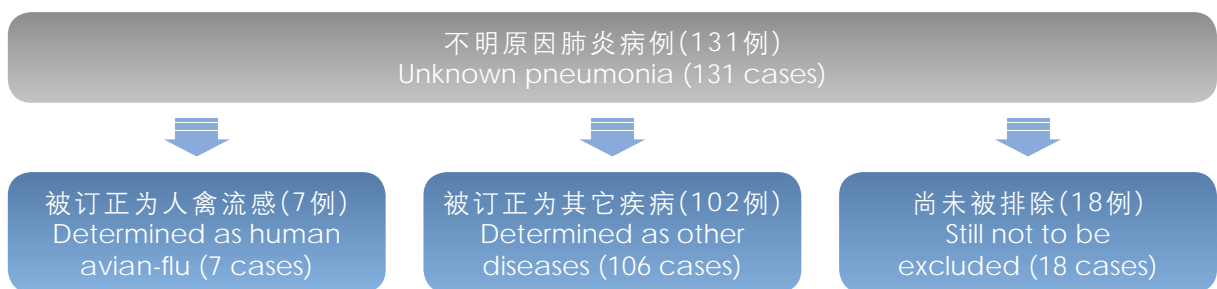


实现对不明原因肺炎病例监测与跟踪

Unknown pneumonia surveillance, as an indicator of possible emerging infectious diseases

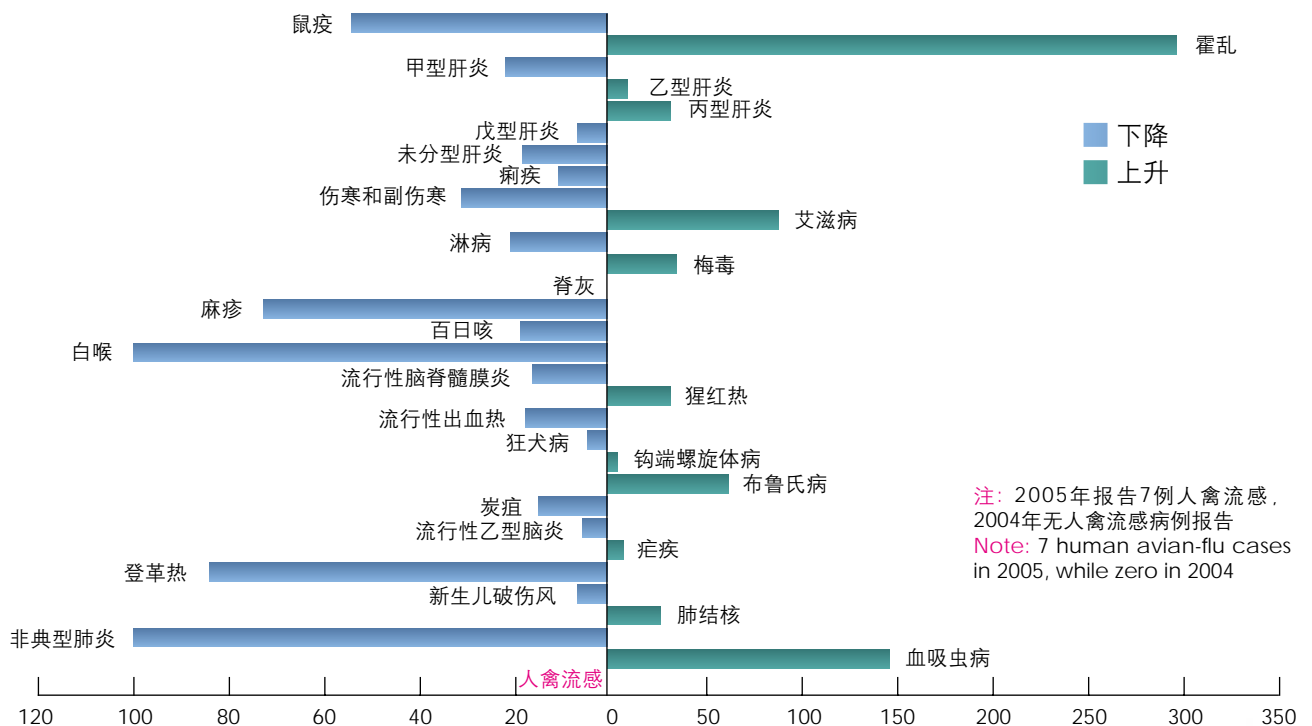
疫情及突发公共卫生事件的及时发现和报告，提高了对不明原因疾病的发现和监测能力，减少了传染病流行和蔓延以及突发公共卫生事件发生对社会经济造成的损失。

The timely discovery of epidemic situation and public health emergencies decreases the disease outbreaks and spreads, and as well as reducing the impact of public health emergencies on society and economy.



2004与2005年法定传染病报告发病率的动态比较

Comparison of incidence of notifiable infectious Diseases for 2004 with 2005

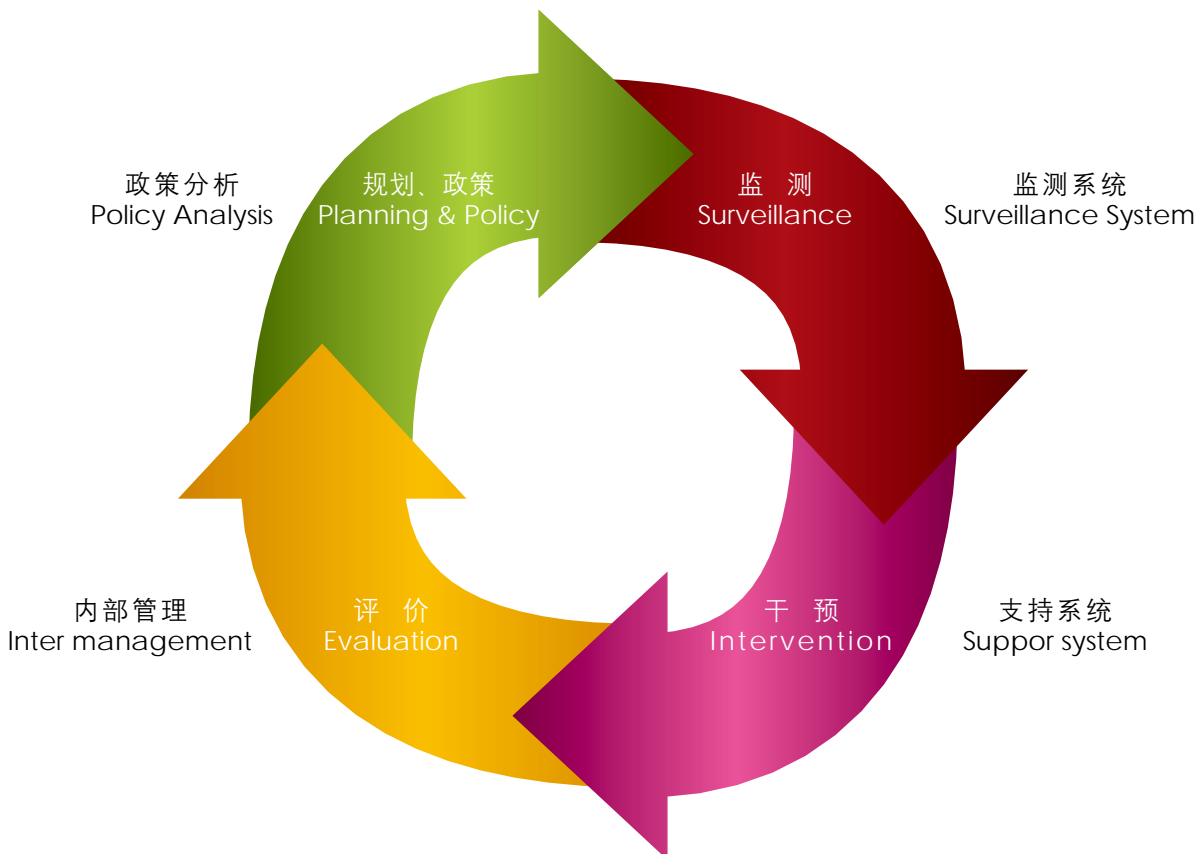


问题与挑战 Problems and Challenges

- 需要建立与完善一些子系统，如实验室信息管理系统、生命登记系统；
Need to establish or improve some sub-systems, such as LIMS system, vital registration system;
- 需要改善IT环境以及数据分析与数据共享能力，为卫生部门快速决策提供信息；
Need to improve IT environment and the capacity of data-analysis and information-sharing for more quickly response and making policy of disease control;
- 需要加强国内外研究机构之间的信息交流与合作。
Need to strengthen cooperation and information sharing with other internal and external institutes.

公共卫生管理示意图

The Public Health Management Life Cycle must be executed collaboratively across the ecosystem



网络直报系统

特 点

◆ 在我国首次实现了疫情及突发公共卫生事件的“个案、实时、在线”报告，覆盖了全国包括乡镇卫生院在内所有卫生医疗机构，是世界上最大的疾病监测系统。低成本、高覆盖、易于普及。

◆ 基于互联网的虚拟专用网络应用集成系统，首次实现了计算机网络技术在公共卫生领域的应用集成创新，极大的提高了对疫情与突发公共卫生事件的响应速度，为及时处理、控制疫情与突发公共卫生事件争取了宝贵的时间。

◆ 直报数据采集与统计软件系统的自主创新。利用先进的海量数据处理技术和IT先进的实时商业智能思想，实现了对监测数据的动态快速统计分析与疾病暴发信息的早期监测。

◆ 由医疗卫生机构直接向中央报告疫情与突发公共卫生事件这种信息管理模式的创新，改变了按月逐级报告的传统模式，是我国公共卫生领域信息管理模式的重大革命，必将引起公共卫生其他领域信息管理模式的变革。

◆ 推动了公共卫生信息标准化建设的进程，统一了全国传染病与突发公共卫生事件监测相关信息标准和最小数据集，为公共卫生信息资源的共享奠定了基础。

◆ It is the largest disease surveillance information system in the world, with the merits of low cost, high coverage, and easy popularization. In our country, it initially realizes the reporting of epidemic situation and public health emergencies by the way of individual case, real time, on line, covering all the hospitals and township health institutes.

◆ As it is integration system of virtual private network on the basis of internet, it initially realizes the applied integrated innovation of internet technique in the field of public health, and greatly improving the response speed in epidemic situation and public health emergencies, therefore it saves the time for epidemic situation and public health emergencies control.

◆ Independent innovation of the data collection and statistical software of real-time internet reporting. By the large data processing technique and advanced IT, it achieves dynamic fast statistical analysis of the monitoring data and early detection of outbreak.

◆ Compared with the traditional method that the surveillance data are reported level by level monthly, it is an innovation that the epidemic situation and public health emergencies are directly reported by medical and health institutes to the national CDC, which would be a major revolution in the information management mode in the field of public health, it would be result in the innovations in other fields of information management mode of public health.

◆ It promotes the progress of public health information standardization, unifies the minimum data set and national surveillance standards of relative information of infectious disease and public health emergencies; moreover, it supports the base for the share of public health information resources.

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