

# NIKSHAY-

## A Web-based Solution for Monitoring of TB Patients

To monitor Revised National Tuberculosis Programme (RNTCP) effectively, a web-enabled and case-based monitoring application called NIKSHAY has been developed by National Informatics Centre (NIC). This is used by health functionaries at various levels across the country in association with Central TB Division (CTD), Ministry of Health & Family Welfare. NIKSHAY covers various aspects of controlling TB using technological innovations. Apart from web based technology, SMS services have been used effectively for communication with patients and monitoring the programme on day-to-day basis.



**SUNIL KUMAR**

Senior Technical Director  
sunil.bhushan@nic.in

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The Revised National Tuberculosis Control Program (RNTCP), incorporating the components of the internationally recommended DOTS strategy for control of TB has been implemented across the country for more than a decade. The spread of Human Immunodeficiency Virus (HIV) during the last 2 decades, the emergence of various forms of drug-resistant TB and unregulated, vast private health sector pose additional challenges to effective TB control.

To monitor the data on individual TB patients across the country, Government of India decided to develop a system called NIKSHAY, which is a combination of two Hindi words- NI (निवारण) and KSHAY (क्षय) meaning eradication of tuberculosis. NIKSHAY (<http://nikshay.gov.in>) is a web enabled application, which facilitates the monitoring of universal access to TB patients' data by all stakeholders. The system has been developed jointly by the Central TB Division of Ministry of Health and Family Welfare and National Informatics Centre (NIC). This was launched by the Government of India in June 2012 with issuance of required administrative directions from Central TB Division for use of NIKSHAY. A gazette notification was published by the Government of India mandating all private health establishments to inform the details of TB patients treated by them to NIKSHAY repository.

NIKSHAY has two broad objectives. One is to create a database of all TB patients including Multi-Drug Resistant cases across the country and the second is to use this database for monitoring and for research purposes at all levels for the eradication of TB effectively in India.

### **OVERVIEW OF NIKSHAY**

The use of Information Technology tools and techniques made it possible for the grass-root level healthcare providers to track data of every TB patient. The most



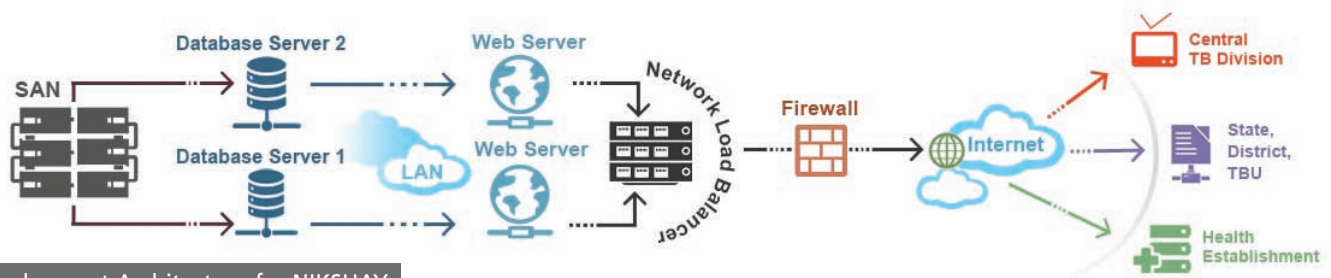
**DR. R. S. GUPTA**

DDG (TB), Central TB Division

'Information Technology has tremendous potential to improve the health services. Central TB Division, Directorate General of Health Services, Ministry of Health & Family Welfare in association with National Informatics Centre (NIC) has developed a case based web based ICT application NIKSHAY, wherein details of all TB patients across the country are entered. The application is used for monitoring and tracking of individual patients notified to the RNTCP. Till now, we have 1.2 million cases entered in this application.

NIKSHAY envisages e-notification of all types of TB cases with provision of free quality assured drugs. NIKSHAY will also be used for e-payments of remunerations to the contractual staff, honorarium for DOT Providers and payments of partners under the programme. We are also looking forward for linkages with e-services like PDS system for provision of nutrition to TB patients with the help of NIC.'

significant feature of NIKSHAY is that it promotes the use of IT upto Tuberculosis Unit (TU) level, thus marginalizing the digital divide. To extend the reach Central TB Division has also developed a Video



Deployment Architecture for NIKSHAY

based training module (in Hindi and English).

NIKSHAY has been implemented at 6 levels across the country i.e. National, State, District & Tuberculosis Unit (TU), Culture & Drug Susceptibility Testing Labs, DRTB Centres. Data entry in terms of registering the TB patients, pre-treatment and follow-up tests, treatment, HIV and contact tracing details is done at TU level. Such TB patient's database is being used at District, State and National level for monitoring purposes.

The Government's health establishments not covered under RNTCP have to inform about TB patients. NIKSHAY facilitates the registration of all such health

establishments and entry of their TB patients.

NIKSHAY utilizes the Short Message Service (SMS) technology effectively. Through SMS, NIKSHAY communicates with TB patients & grass-root level healthcare service providers as well as health and family welfare policy makers, health managers and health administrators at different tiers of the Healthcare Delivery System. Whenever a new patient is registered on NIKSHAY, SMS is sent to the patient with registration ID and details of DOTS Operator along with an advisory note to take the regular medicine. Daily SMS is sent to all monitoring authorities from

Central TB Division (CTD) to State TB Officers (STO), District TB Officers (DTO) giving the number of TB patients, Designated Microscopic Centre (DMC)/Peripheral Health Interface (PHI) registered, profiles of STOs, DTOs and TUs updated, entry of contractual manpower, Health establishments registered and patients that have been notified.

NIKSHAY is a role based web application with 6 distinct roles allocated to different levels as per details given in the table.

**CURRENT STATUS**

NIKSHAY was launched on 4 June, 2012 at <http://www.nikshay.gov.in>. As of now, more than 12.5 lakh TB patients have been registered. Details of 38,051 DMCs/PHIs, 2490 TBUs, 655 DTOs and 35 STOs are available on NIKSHAY.

**TECHNOLOGY ADOPTED**

NIKSHAY has been developed using Windows Server 2008 R2 as Operating System, MS SQL Server 2008 Enterprise as Database, Internet Information Server (IIS) as Web Server and .NET (C#) as development tool.

**IMPACT**

After the operationalization of NIKSHAY, substantial improvements have been observed in RNTCP operations. The programme implementing authorities at all levels are now enabled to retrieve details of any TB patient and if necessary, contact them for monitoring their DOTS administration schedule. Another benefit of NIKSHAY is a correlation between TB & HIV, leading to an outcome analysis of treatment, which may give new directions to TB treatment in the coming years.

Role	Modules
Tuberculosis Unit Level	TB Patient Registration, Contact Tracing, HIV Treatment, Treatment Outcome, Follow Up, TB Notification Patient Details Entry, Search TB Patient by Patient ID or Navigation, Master Management of DMC/PHI, User Management, Reports, Training Video
District Level	TB Notification Health Establishment Registration and Patient Details Entry, Contractual Staff Entry at district level, Search TB Patient by Patient ID or Navigation, Master Management, User Management, Reports
State Level	Search TB Patient by Patient ID or Navigation, Contractual Staff Entry at the state level, User Management of TUs and districts under the state, Master Management of TUs under all districts of the state, Reports
Central TB Division	User Management for State/District and TUs, Master Management, Data Management, Contractual Staff Entry at CTD level, Search TB Patient by Patient ID or Navigation, Reports, Dash Board Reports
Culture & Drug susceptibility Laboratories	User Management, Master Management (CDSLAB Coverage Area mapping), Human Resource Management (Contractual Staff Details), CDST Details (Registration, Smear Microscopy Results, Molecular TB/DST Results, Culture Results, DST Results)
DRTB Centres	User Management, Master Management (DRTBC Coverage Area Mapping), Human Resource Management (Contractual Staff Details), MDR Patients (Registration, Decisions Details, HIV Treatment, Treatment Details, Lab Results Details, Treatment Outcome)

**For Further Information**

Sunil Kumar  
 Senior Technical Director  
 Health Informatics Division, NIC  
 E-mail: [sunil.bhushan@nic.in](mailto:sunil.bhushan@nic.in)