

NEWS IN FOCUS

RUSSIA Resurgence of funding helps to lure expatriates home **p.428**

GENETICS Excitement and doubts over RNA editing claims **p.432**

VACCINES The high-stakes search for rare but real side effects **p.436**



VACCINES Revitalizing the quest for an HIV vaccine **p.439**

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Children are still being disabled by polio in Pakistan despite years of effort to eradicate the disease.

PUBLIC HEALTH

Polio clings on in Pakistan

Fears grow that health-service reforms may let virus flourish, just as the global eradication effort reaches its endgame.

BY EWEN CALLAWAY

Asif Ali Zardari, the president of Pakistan, held a meeting last month to tackle yet another setback for his troubled nation. The focus was neither Al-Qaeda's resurgence nor poor diplomatic relations with the United States — it was polio, a crippling disease that has been wiped out in almost every other part of the world.

As an assessment of the global polio eradication campaign by its Independent Monitoring Board warns, "Pakistan risks being the country that prevents global polio eradication" (see go.nature.com/7tnvcg). After a spike in cases in Pakistan last year, a new emergency action plan

to tackle the threat is off to a slow start with at least 36 confirmed cases this year. Meanwhile, constitutional reforms that will eliminate the country's central health ministry could slow efforts to turn the tide.

The push to make polio the second human pathogen after smallpox to be eradicated began in 1988. That year, an estimated 350,000 people developed poliomyelitis, an insidious infection that attacks the nervous system and can render patients paralysed within hours. The Global Polio Eradication Initiative, a public-private partnership led by the World Health Organization (WHO), hoped to finish the campaign by 2000. Yet many countries in Africa and central Asia did not begin eradication until the

mid-1990s. Pakistan, meanwhile, successfully reduced its burden from 1,155 cases in 1997 to 28 in 2005.

By the mid-2000s, fewer than 2,000 people worldwide contracted polio each year, with the vast majority of cases occurring in Nigeria and India, where the campaign faced obstacles including vaccine boycotts. Public-awareness and vaccination campaigns have beaten back the disease since then: India has recorded just one case so far this year, and Nigeria eight.

"India and Nigeria decided to put on the retro-boosters and they dropped their cases from the thousands to below the levels of Pakistan," says Bruce Aylward, an assistant director-general at the WHO and head of the polio eradication campaign. "All of a sudden Pakistan is in the glare."

Pakistan is one of four countries in which polio is still endemic (see 'Stubborn holdouts'), but with 144 confirmed cases in 2010, it is the only country in which polio is making a comeback. The worsening situation in Pakistan could put gains elsewhere at risk. "As long as there's polio in any one country it's a threat to every country in the world," says David Heymann, chairman of the board of the UK Health Protection Agency and a former assistant director-general of the WHO involved in polio eradication.

Climate, population density and other factors make the virus particularly infectious in Pakistan, Aylward says, requiring child vaccination rates of more than 95% to prevent its rapid spread. Yet immunization rates and surveillance are weak in Pakistan, according to the report released last month by the Independent Monitoring Board. Last year's floods displaced millions of people, spreading the virus and undercutting vaccination efforts. Poor security and religious opposition in the country's Federally Administered Tribal Areas may partly explain low vaccination rates there, but not the polio hotspot in the southern city of Karachi. Unaccountable local government officials and poor health infrastructure also plague many districts where polio has held on, according to the monitoring board report and WHO officials.

Donald Henderson of the Center for Biosecurity at the University of Pittsburgh Medical Center in Baltimore, Maryland, who led the ▶

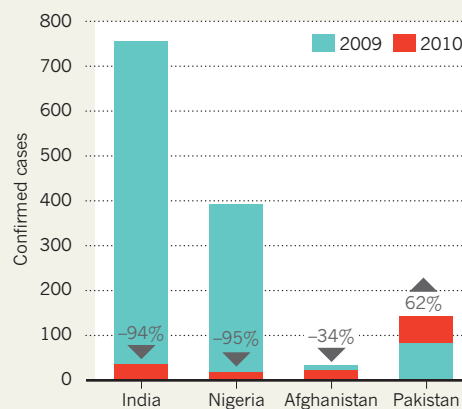
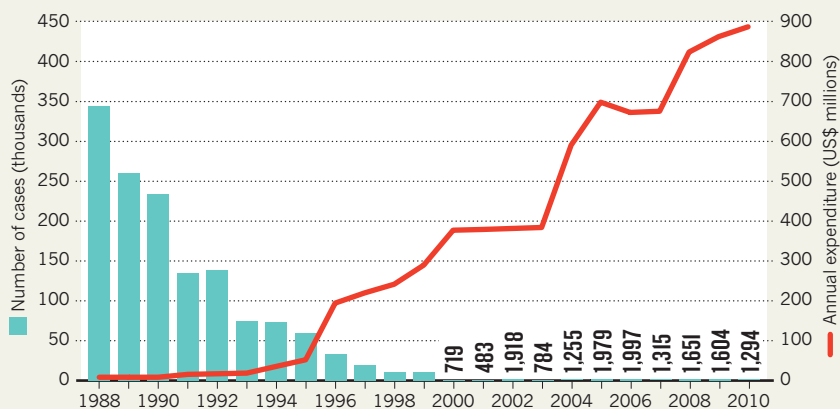


VACCINES

New promise, old doubts
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STUBBORN HOLDOUTS

Progress on eradicating polio has plateaued since 2000, with Pakistan proving the toughest nut to crack.



SOURCE: IMB REPT./GLOBAL POLIO ERADICATION INITIATIVE

► WHO's war on smallpox in the 1960s and 1970s, says that smallpox also lingered in Pakistan long after it was eradicated from India and Bangladesh, which had similar natural obstacles to eradication. "To be experiencing polio is kind of a paradox," he says. "There's something seriously wrong with their health services."

Pakistan's government has not ignored the problem. In January, the country rolled out an emergency action plan, with the goal of halting virus transmission by the end of 2011. The plan seeks greater accountability at all levels of government to boost immunization rates, and it calls for health officials to work with the military and local leaders in tribal areas to build support for vaccination. Frustrated with the lack of progress reported at the April meeting, President Zardari also ordered an investigation into recent

polio outbreaks in Sindh and Balochistan, and formed a new oversight committee to keep him personally informed about eradication efforts.

Yet some fear that looming constitutional reforms could make it harder for Pakistan to exterminate polio. The country is set to devolve its Ministry of Health by the end of June, part of a long-delayed move to transfer more power to provincial governments. Bill Gates, whose Bill & Melinda Gates Foundation in Seattle, Washington, funds polio eradication programmes, has expressed concern about the changes directly to Zardari. Sania Nishtar, a health-policy expert who heads Heartfile, an independent health-policy think tank in Islamabad, worries that without a central health authority to coordinate international donors' efforts and vaccine procurement and distribution,

Pakistan's polio campaign will suffer.

Aylward, however, believes that the constitutional change is a "manageable risk". With eradication funding in Pakistan expected to reach US\$137.5 million over the next two years, he wants to see clear signs of success. He hopes that the campaign will stop transmission of the virus by the end of 2012. In the meantime, after a couple of large vaccination campaigns, officials will assess whether the virus has vanished from some areas of Pakistan, and will look for a decline in the genetic diversity of the remaining virus — that would suggest that polio is on its last legs.

Simply blaming Pakistan for inaction is unhelpful, Aylward adds. "Everybody wants a whipping boy," he says. "Let's help them get this finished. This is our Alamo." ■ [SEE COMMENT P.446](#)

FUNDING

Russia revitalizes science

Researchers drawn by 'mega-grants' find rewards and frustrations in equal measure.

BY QUIRIN SCHIERMEIER

Siberia, of all places? Ernst-Detlef Schulze's wife rolled her eyes when her husband agreed to lead a major ecosystem study in the Yenisey region in the heart of Russia's eastern vastness. At first, Schulze, the founding director of the prestigious Max Planck Institute for Biogeochemistry in Jena, Germany, had been hesitant himself — but sensing a unique opportunity to study how the Arctic tundra and boreal forests store and release carbon, he decided to pack his bags.

The German carbon-cycle expert is one of 40 foreign or expatriate Russian scientists working in the West who last year received a new type of grant to bring their expertise to

Russian universities. The 12-billion-ruble (US\$428-million) 'mega-grant' programme is part of Russia's attempt to strengthen research at its neglected universities and modernize the country's science and economy at large (see *Nature* **465**, 858; 2010).

The ambitious plan is clear evidence that research money is now flowing generously in Russia, where a once-vast scientific workforce shrank dramatically in the years after the collapse of the Soviet Union (see 'After the fall'). The will to revitalize science is real, says Schulze. Alas, Kafkaesque bureaucracy and a thicket of often-opaque regulations have survived the changes.

The Russian government is trying to smooth the way. This week, following a letter

of complaint from scientists at Moscow State University (MSU), President Dmitry Medvedev met grant recipients to discuss the problems they have experienced, and promised to address them. But doing science in Russia remains a challenging, and often frustrating, mission for anyone unfamiliar with the country's idiosyncrasies, says Schulze.

"The administrative, legal and academic environment can be perplexing," he says. "Essentially, you need very good contacts and a great deal of local support. If you arrive unprepared — thinking only that it would be cool to do some science in Siberia — you're lost."

Fortunately, Schulze does enjoy plenty of support. During his long career he has published more than 20 papers with