

Regression in polio eradication in Pakistan: A national tragedy

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Abstract

Polio is one out of 200 infections results to lasting paralysis, usually in the legs. The year 2014 has been the saddest year for the Pakistan when the World was about to eliminate Polio from all over the World. In year 1994 Pakistan took the initiative to eliminate Polio from the country. The efforts were going well until 2005, when Pakistan was on the wedge to overcome the Disease. The hopes were high that soon Pakistan will become a polio-virus-free country, but the drone strikes in FATA and the rise of different militant groups as a reaction of the drone attacks in FATA made it difficult for the health workers to continue their vaccination campaigns in these areas. However various factors ruined the efforts made to eradicate Polio. In Pakistan, polio is widespread to three sections. These are Karachi, Quetta block (Quetta, Pishin and Killah Abdullah district) and FATA and Peshawar district. Numerous things are accountable for polio flourishing in these regions. These comprise near to the ground socioeconomic rank of the families, not having the knowledge concerning hazard caused by polio and disinformation by limited significant people concerning how polio vaccines fabricate damage. In 2014, only 3 countries in the world remain polio-endemic: Nigeria, Pakistan and Afghanistan. From year 2012-2014 the number of registered Polio cases is on rise contrary to rest of the other two Polio-endemic countries. In spite of the extensive work done by Polio workers the number of Polio cases has broken the 16 year record. The situation is getting worse because it can also be threatening to the rest of the World.

Keywords: Poliomyelitis, Immunization, 2014, Endemic Countries, Pakistan, Polio Outbreaks.

Introduction

The words polio (grey) and myelon (marrow, indicating the spinal cord) are derived from Greek.¹ The effect of poliomyelitis virus on the spinal cord leads to typical manifestation of paralysis. Polio is incapacitated and obvious destructive infection. There is no repair to

damage yet there are safe and flourishing vaccines. So the approach to eliminate polio is based upon to evade disease by vaccinating all children (less than 5 years old) to cease dispersal and ultimately make the world polio liberated.² Poliovirus is a limb of the enterovirus subgroup, family Picornaviridae. Enteroviruses are temporary residents of the gastrointestinal tract, and are secure at acid pH. Picornaviruses are undersized, ether-insensitive, with RNA as genetic material.³

The polio virion consists of a single-stranded positive sense RNA molecule encapsidated by an icosahedral capsid which is self-possessed of four proteins VP1, VP2, VP3 and VP4.⁴ Being enteroviruses, they are temporary inhabitants of the gastrointestinal tract and thus, are stable at acidic PH but can be quickly inactivated by formaldehyde, chlorine, heat, and ultraviolet light.⁵

Polio is of the infections that cause irreparable damage to the body. The virus spreads throughout the body by means of blood stream and finally reaches the central nervous system and damages are manifested in the form of paralysis.⁶ As it proliferates, the virus demolishes the nerve cells that stimulate muscles. The paralyzed muscles are no more constructive and the extremity becomes disk and dead — a state recognized as acute flaccid paralysis (AFP).

Major Outbreaks and Polio Vaccination

Major polio outbreaks were unidentified earlier than the 20th century; limited to small areas. Paralytic polio outbreaks began to come into view in Europe and the United States around 1900.⁷ By the widespread use of poliovirus vaccine in the mid-1950s, the incidence of poliomyelitis decreased swiftly in several industrial states. In United States of America, the number of Polio paralysed cases per annum in 1952 declined from more than 20,000 to fewer than 100 cases in the mid-1960s. Recent known local diffusion of wild poliovirus in the United States was in 1979. Polio generally influences children below 5 years of age.

Afghanistan, Pakistan, Nigeria and India were the most recent countries to report wild poliovirus type 2 isolates in 1997, 1998, and 1999 respectively.⁸ By 2006, the annual number of WPV cases had decreased by more than 99% and only four outstanding countries had never

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interrupted WPV diffusion: Afghanistan, India, Nigeria, and Pakistan.

Global Polio Eradication Initiative (GPEI)

The decrease is the consequence of the worldwide attempt to eliminate the infection. In 2014, only three countries (Afghanistan, Nigeria and Pakistan) continue transmission as compared to 125 in 1988⁹ (Figure-1).

In 1988, the World Health Assembly decided to interrupt wild poliovirus (WPV) transmission worldwide. A public health effort to eliminate all cases of poliomyelitis (polio) infection around the world, started in 1988 and was Headed by the World Health Organization (WHO), aided by the UNICEF and Rotary Foundation. There is a significant decrease in Polio cases from a predictable 350 000 cases then, to 416 accounted cases in 2013 that is about 99% since 1988.¹⁰

The US Centers for Disease Control and Prevention (CDC), UNICEF, helped by key associates together with the Bill and Melinda Gates Foundation put their efforts towards elimination of the poliovirus in the Americas, and Rotary International's obligation to lift resources to guard all kids from the ailment.¹¹

Endemic Countries From 2011-2014

On the whole, Polio cases have reduced by over 99% since 1988. There were only 385 accounted cases in 2013.¹² During 2013, estimated national routine vaccination coverage of infants with 3 doses of oral poliovirus vaccine

Table-1: Reported cases in the four Endemic Countries in 2011.

Sr. No.	Country	Reported polio cases in 2011 ¹⁶⁻¹⁷		Transmission Status
		Wild Cases	Circulating Vaccine-derived Cases	
1	Pakistan	198	0	Endemic
2	Afghanistan	80	1	Endemic
3	Nigeria	62	34	Endemic
4	India	1	0	Endemic
	Total	650	57	

(OPV3) was 71% in Afghanistan and 72% in Pakistan.¹³ In 2011 just four countries in the world (Nigeria, India, Pakistan and Afghanistan) were accounted to have prevalent poliomyelitis.¹⁴ A whole of 1,997 cases globally were accounted in 2006; of these the bulk (1,869 cases) occurred in countries with prevalent polio. Nigeria accounted for the majority of cases (1,122 cases)¹⁵ but India accounted additional ten times more cases this year than in 2005 (676 cases, or 30% of worldwide cases). Pakistan and Afghanistan accounted 40 and 31 cases in that order in 2006. Polio re-surfaced in Bangladesh after almost six years of nonexistence with 18 new cases accounted. "Our country is not protected, as neighbors India and Pakistan are not polio liberated", stated Health Minister ASM Matiur Rahman¹⁵ (Table-1).

In 2014, only 3 countries in the world remained polio-endemic: Nigeria, Pakistan and Afghanistan. In 1994, WHO declared the Region of the Americas as polio-free,

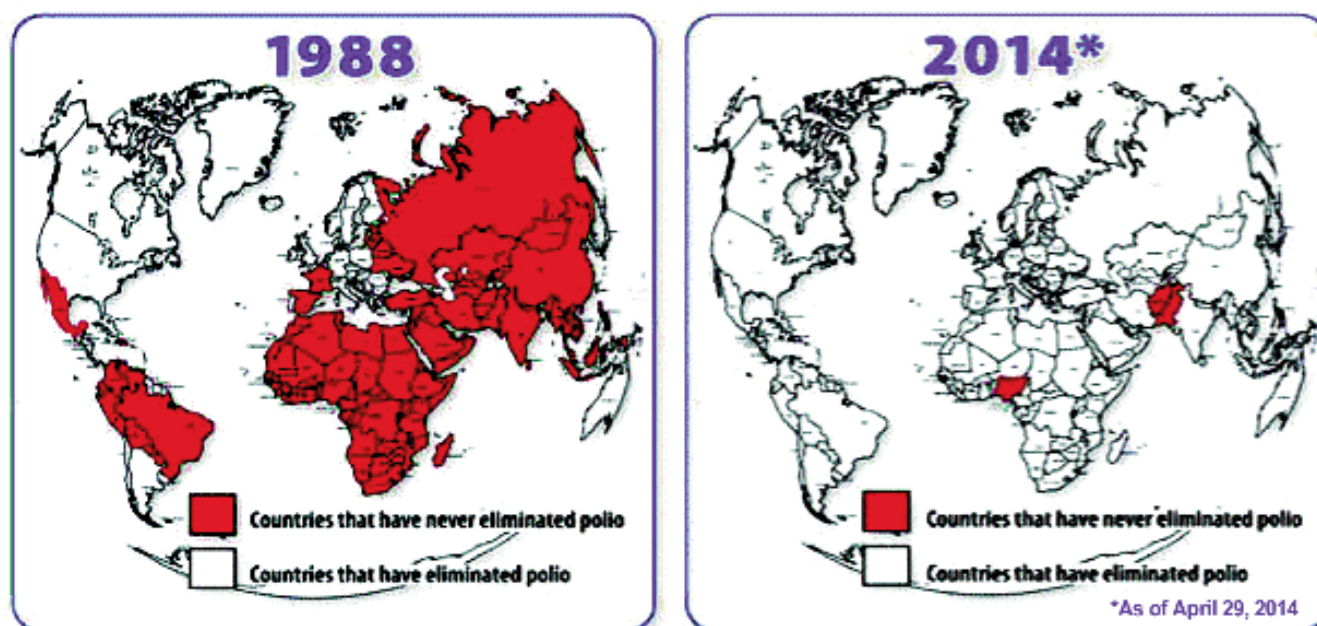


Figure-1: Progress Against Polio Elimination throughout world from 1988-2014.

followed by Western Pacific Region in 2000 and in 2002 European Region was certified as polio free. On 27 March 2014, the WHO South-East Asia Region was certified polio-free, meaning that transmission of wild poliovirus has been interrupted in this block of 11 countries stretching from Indonesia to India. This achievement marks a significant leap forward in global eradication, with 80% of the world's population now living in certified polio-free region. The last reported cases of polio in India were in West Bengal and Gujarat on 13 January 2011. If no fresh case is reported till 2014, the country will be declared polio free.¹⁶

Earlier this year i.e. 2014, the World Health Organisation (WHO) had removed India from the list of polio-endemic countries.¹⁷ So India was polio-free for a year, first time in history on the map of world.¹⁸

Reality in Pakistan

Pakistan took the initiative towards Polio Elimination in 1994, after 15 years commence of the prolonged Programme for vaccination; the government took this task on basis and the project was going well uptill 2008. Since 2000, the Polio control programme has been on the right track and achieved some success in developed countries. This was made possible by regular polio vaccination with gigantic country-wide movements numerous times a year to distribute drops of oral polio vaccine to each child below five years. In 2005, the number of Polio cases was brought down to only 28 with the continuous efforts of health workers and support of Government of Pakistan Figure-2. The hopes were high that soon Pakistan will become a polio-virus-free country, but the drone strikes in FATA and the rise of different militant groups as a reaction of the drone attacks in FATA made it difficult for the health workers to continue their vaccination campaigns in these areas.¹⁹

Pakistan presents one of the most complex polio

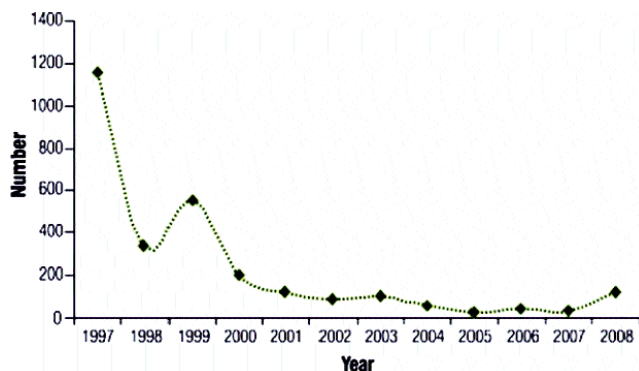


Figure-2: Progress towards the elimination of poliomyelitis in Pakistan from 1997-2008.

eradication environments in the world both as geographically as well as the law and order situation inside the country as well as in its neighbors. The country has reported 297 cases for the current year compared to 93 in 2013.²⁰ The numbers of infected districts has also risen to 40 compared to 22 in 2013. Environmental sampling results further confirm that since January 2014, the virus is circulating across the country. Number of polio cases has reached 297 this year as another four cases surfaced in Pakistan.²¹

In Pakistan, polio is widespread in three sections. These are Karachi, Quetta block (Quetta, Pishin and Killah Abdullah district) Federally administered tribal areas (FATA) and Peshawar district. Numerous reasons are accountable for polio flourishing in these regions. These comprise near to the ground socioeconomic rank of the families, not having the knowledge concerning hazard caused by polio and disinformation by limited significant people concerning how polio vaccines fabricate damage.²²

According to the information assembled by the National Emergency Operations Centre as one day campaign was conducted in 97 UCs of Peshawar on December 7, 2014. Provincial Control room shared the coverage that out of total 754,383 targeted children 684,557 (91%) children were vaccinated. A total of 9,237 persons were not present during the one day campaign and 16,335 children were not available during the one day campaign activity.²³

In spite of the huge progress made towards eradicating polio, attempt to eradicate last 1% of polio cases is proving to be difficult and expensive. Persistent pockets of transmission in the three remaining endemic countries are the key challenge to success. Until polio has been eradicated from these last remaining reservoirs, children across the world will remain at risk. Time and again, polio-free countries have been re-infected by virus originating in the endemic areas. In fact, there is strong evidence to suggest that failure to eradicate polio in these last endemic areas could result in a massive resurgence of the disease. Within ten years, the world could again see 200,000 new cases every single year. This would be a humanitarian catastrophe that must be averted at all costs.²⁴

Inevitably, the World Health Organization (WHO) has declared Pakistan a polio-exporting country and has imposed travel bans on its citizens. WHO's Emergency Committee members and its expert advisors held a two-day meeting on the alarming spread of polio on April 28 and 29 in Geneva. There is also evidence that Pakistan exported the virus to Syria and Cameroon.¹⁸ Countries which are currently exporting wild poliovirus should

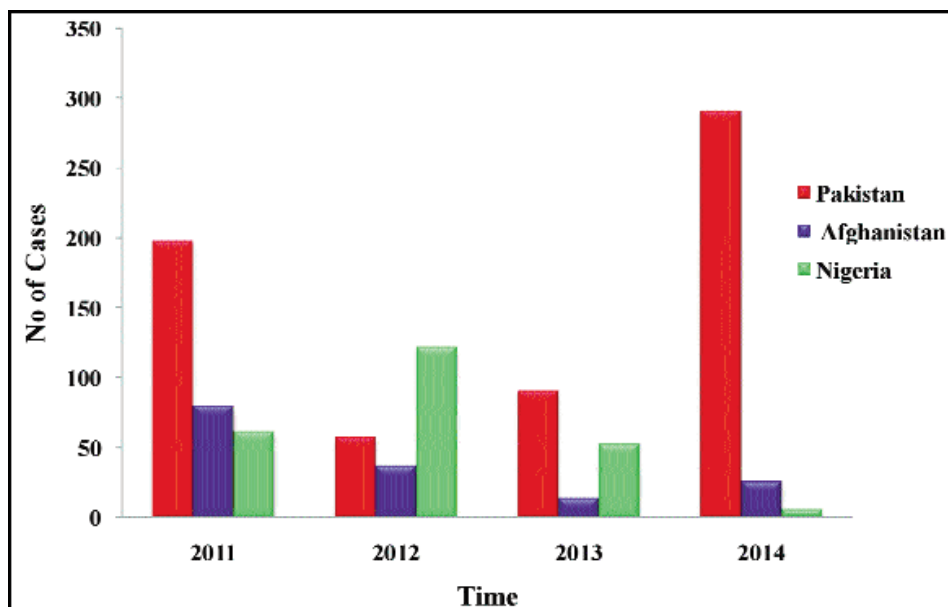


Figure-3: Comparison of Reported cases of Polio from 2011-2014 in Endemic Countries.

ensure that all residents and long-term visitors (of over 4 weeks) receive a dose of oral polio vaccine (OPV) or inactivated poliovirus vaccine (IPV) between 4 weeks and 12 months before international travel; and should ensure that such travelers are provided with proof of vaccination²⁵ (Figure-3).

Challenges for Pakistan to Eradicate Polio

■ **The political, religious and complex security situations are the major risks for the Programme in Pakistan in 2013.**

All three Endemic countries in 2014 have similarities of Political uncertainty, religious fundamentalists, and security concerns. Hostilities and militancy is at climax in Quetta, KPK and Northern areas of Pakistan, the polio Endemic Areas. Administrators declare the number of polio cases verified in Pakistan has reached 295 for the year 2014 — a 14-year high. Different militant groups in Pakistan started targeting Polio vaccination teams, especially in FATA and KPK. After several attacks on vaccination teams and killings of several polio workers of the vaccination team, the campaign was stopped in FATA. After the Abbottabad action held on 2nd May, 2011, it came to be known knowledge that a false vaccination movement was performed in Pakistan by the CIA for which diverse NGOs were used. This false movement severely spoiled the hard work completed by the polio workers and the Government of Pakistan to eliminate Polio since 1999.²⁶ Various militant groups in Pakistan

started targeting Polio vaccination teams, especially in FATA and KPK. In 2012 the militants ordered a complete ban on vaccinations in the tribal areas in western Pakistan as a response to US drone attacks.¹³ In an interview with Dawn, WHO's special envoy on global polio eradication and primary healthcare, Dr Hussain A. Gezari said: "This person (Dr Afridi) was not supported either by the government of Pakistan or any international donor agency for any immunisation campaign, and secondly, we don't collect blood samples during vaccination campaigns." Dr Afridi is currently under the custody of intelligence agencies and has been booked

by the government on the charge of treason.²⁷

■ **Every time a child or adult travels abroad from Afghanistan, Nigeria or Pakistan, there is a risk that the polio virus may be carried with it.**

The transmission of polio across Pakistan and Afghanistan's border is very easy. Transmissions of polio virus to the rest of the world is a scare especially for countries which are polio free. To avoid spread to other countries, WHO suggested some travel restriction in Nov 2012 on Pakistani.²⁸ This can also be applied to within Pakistan on people travelling from polio infected areas to polio free provinces.

■ **When the same children are missed by successive vaccination campaigns, frequent campaigns may not be the best strategy to stop polio transmission.**

The major problem for eradicating polio from Pakistan has also been the refusal of families for Immunization. This is a setback for the Polio campaign. One of the officials stated that recorded figures of the families who refused vaccination is 50,000 but according to a rough estimate almost 150,000 families have refused polio vaccination.²⁹ The comparison of the data of the refusal for vaccination is also not so satisfactory. Pashtun ethnicities have more trends for not accepting the polio vaccination³⁰ (Table-2).

Pakistan also faces opposition to vaccination by parents - often with the "justification" that the vaccine is part of a

Table-2: Comparison of number of families refused to polio vaccination.

Immunization Year		2011	2012	2013	2014
Refusal Families	I	34,966	6,233	12,813, and	23,244 3,014
	II	15,663	1702	10,100, and	17,100 455

conspiracy to sterilize Muslims. People think that a polio vaccination twice or thrice a year is enough," he said.³¹

■ Expired polio vaccine

In 2014 the major problem in polio endemic regions was the security issue however in some areas despite vaccination the children could not be saved. The results of an investigation conducted by the polio eradication section of the National Institute of Health, it was revealed that almost 78% of established cases in Pakistan concerned children who were given manifold polio Vaccinations. The motive behind the huge number of children who had been vaccinated, the ineffectiveness of the vaccine was related to the storage issue or the use of outdated Vaccine. It has been advised that the storage temperature should be -20 degree centigrade, but it can be effective even at 2 to 8 degree centigrade. The rural areas of Pakistan are facing energy crisis and this could be a cause for the vaccines losing its efficacy.²¹

Some Extremists are a key feature in the crash of immunization programmes of polio in Pakistan, because they rely on the false information delivered to them. They Kidnapped, malhanded or assassinated Polio workers. Analysts have recognized diffusion of wild poliovirus from polio-endemic districts in Afghanistan, the majority of which are situated in the southern region of this country bordering Pakistan, to tribal areas of Pakistan. This transmission has resulted in new cases of polio in previously polio-free districts. Same is true for Pakistan. There is a myth prevalent in many of the areas with low literacy rates that the immunization sterilizes the local population.³²

Conclusion

Pakistan was moving in the correct path up till 2012. The year 2012 was relatively satisfying in context of Polio Eradication from Pakistan by the end of year 2016, the goal set by GPEI. However the coming year was not good because there was relatively increase in the number of registered Polio cases. The year 2014 has been a bad period in spite of all the efforts made by the Government of Pakistan, UNICEF, WHO and polio partners including, Rotary International to eliminate polio from the country. The progress of this year shows that we as a nation are not taking the issue seriously. The officials should focus on

this issue of national interest and take some extra measures to cope with it. Specific strategies connected to anti-polio immunization movement in security negotiation areas are immediately required, secure checking of anti-polio vaccination campaigns is necessary to guarantee liability and to conquer issues behind deprived exposure. Pakistan can adopt the plan of the other successful countries to eradicate Polio. If Pakistan fails to eradicate the disease, the country may go through some extra sanction of travelling and there will be automatically impact on our Economy. It's the high time to take some decisions which can be harder.

References

1. Chamberlin SL, Narins B. The Gale Encyclopedia of Neurological Disorders. Detroit: Thomson Gale, 2005; pp 1859-70.
2. Brookman F. Hair care products. In: McDonough J, Egolf K, Reid JV, editors. The Advertising Age encyclopedia of advertising. New York: Fitzroy Dearborn, 2003; pp 703-08
3. Cohen JL. Harrison's Principles of Internal Medicine. 16th ed. America: McGraw-Hill Professional; 2004.
4. He Y, Mueller S, Chipman PR, Bator CM, Peng X, Bowman VD, et al. Complexes of poliovirus serotypes with their common cellular receptor, CD155. J Virol 2003; 77: 4827-35.
5. Ryan KJ, Ray CG. Sherris Medical Microbiology. 4th ed. America: McGraw Hill, 2004; pp 535-7.
6. Katz SL, Gershon AA, Krugman S, Hotez, PJ. Krugman's infectious diseases of children. St. Louis; Mosby; 2004, pp 81-97.
7. Falconer M, Bollenbach E. Late functional loss in nonparalytic polio. Am J Physical Med Rehab/ Assoc Acad Physiatri 2000; 79: 19-23.
8. Trevelyan B, Smallman-Raynor M, Cliff A. The Spatial Dynamics of Poliomyelitis in the United States: From Epidemic Emergence to Vaccine-Induced Retreat, 1910-1971. Ann Assoc Am Geogr 2005; 95: 269-93.
9. CDC. Apparent global interruption of wild poliovirus type 2 transmission. MMWR Morb Mortal Wkly Rep 2001; 50: 222-4.
10. Maria C. UN: Spread Of Polio Is A World Health Emergency. The Huffington Post 2014 May 5.
11. Poliomyelitis: intensification of the global eradication initiative/Report by the Secretariat. [online] [cited 20 Dec 2012]. Available from: URL: http://apps.who.int/gb/ebwha/pdf_files/EB132/B132_17-en.pdf.
12. Fujimura SF. The Man Who Made Polio History. Pan American Health Organization, 2007.
13. Durrani A. understanding-polio-eradication-campaign Pakistan. [online] [Cited 2014 May 17]. Available from: URL: [http://www.pakistankakhudahafiz.com/ Understanding Polio Eradication Campaign in Pakistan](http://www.pakistankakhudahafiz.com/UnderstandingPolioEradicationCampaigninPakistan).
14. Wild Poliovirus Weekly Update. Global Polio Eradication Initiative; 2010.
15. Bangladesh begins new polio drive. BBC News 2007 March 2.
16. Polio's Return after Near Eradication Prompts a Global Health. New York Times Warning 2014 May 5
17. WHO South-East Asia Region certified polio-free. WHO. Geneva; 27 March 2014.
18. William T. India Winning Polio Fight. The Diplomat 2012 Feb 12.
19. Krista M. How India Fought Polio -and Won. TIME 2013 Jan 13.
20. Polio Case Count. World Health Organization. Geneva: 9 September 2015
21. Nishtar S. Pakistan, politics and polio. Bull World Health Org 2010; 88: 159-60.

22. Moturi EK, Porter KA, Wassilak SGF, Tangermann RH, Diop OM, Burns CC, et al. Progress toward polio eradication-worldwide, 2013-2014. *MMWR Morb Mortal Wkly Rep* 2014; 63: 468-72.
 23. Naeem M, Adil M, Abbas SH, Khan MZ, Naz SM, Khan A, et al. Coverage and causes of missed oral polio vaccine in urban and rural areas of Peshawar. *J Ayub Med Coll Abbottabad* 2011; 23: 98-102.
 24. Barrett S. Eradication versus control: the economics of global infectious disease policies". *Bull World Health Organ* 2004; 82: 683-8.
 25. Wilder-Smith A, Leong Wei-Yee, Lopez L F, Amaku M, Quam M, Khan K. Potential for international spread of wild poliovirus via travelers. *BMC Med* 2015; 13: 133.
 26. Swain F. CIA fake vaccination programme used in hunt for Osama bin Laden could cost lives. [Online] 2011 [cited 2015 March 13]. Available from: URL: <http://www.telegraph.co.uk/news/science/8646547>.
 27. Bin Laden death: CIA doctor' accused of treason. *BBC News* 2011 October 6.
 28. Jundiai I. Govt launches polio drive in inaccessible tribal areas. [Online]. 2014 [Cited 2015 Feb 25]. Available from: URL: <http://www.dawn.com/news/1146757>
 29. Shah S. CIA tactics to trap Bin Laden linked with polio crisis, say aid groups. *The Guardian*. [online] [cited 2012 May 27]. <http://www.theguardian.com/world/2012/mar/02/aid-groups-cia-osama-bin-laden-polio-crisis>.
 30. The Guardian. Heidi Larson The CIA's fake vaccination drive has damaged the battle against polio. [online] [Cited 2012 May 27]. Available from: URL: <http://www.theguardian.com/commentisfree/2012/may/27/cia-fake-vaccination-polio>.
 31. Teepu IA. WHO rejects polio rumours. *Dawn* 2012 Feb 26.
 32. Dawn News, Rising polio cases may cause more travel restrictions. [Online] [Cited 2014 Oct 18. Available from: URL: <http://www.dawn.com/news/1138755/rising-polio-cases-may-cause-more-travel-restrictions>.
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