

Reasons for the Failure of Polio Eradication in Pakistan

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ABSTRACT:

OBJECTIVE:

To elaborate the reasons for the failure of Polio eradication in Pakistan.

METHOD:

We have done a descriptive study to measure the reasons for failure of polio control in Pakistan among 100 people from various districts of Punjab and K.P.K. that had children of <5 years at their homes. Coverage and awareness was good. The only barrier was the lack of interest among the people to vaccinate their children, limited advocacy and communication resources, poor health service structure problems in vaccinating areas and field programs and unreliable reporting, poor monitoring, supervision, unclear roles and responsibilities and decentralization

RESULT: *The Government is making substantial efforts for Polio eradication but there are certain drawbacks on the behalf of the community which are posing hurdles in the making of Polio-Free Pakistan*

CONCLUSION:

Despite substantial efforts to eradicate poliomyelitis by administering oral polio vaccine through routine immunization and annual National Immunization Days, Pakistan reported 63 polio cases in the year 2011 as compared to 36 cases previous year. Reasons for

continued high poliomyelitis incidence include failure to vaccinate, vaccine failure or inadequate immunization strategies. The study highlights various short comings and bottlenecks in the EPI and the barriers identified should be considered in prioritizing future strategies.

INTRODUCTION:

The sustained effort of the Global Polio Eradication Initiative (GPEI) to vaccinate children in Pakistan reduced cases of serotype 1 and 3 poliomyelitis between 2005 and 2007 in both countries.¹ However, since 2008, the annual incidence of poliomyelitis in Pakistan has increased, and in 2011, Pakistan reported the highest incidence of poliomyelitis in a decade. Over 60% of all cases in endemic countries and 34% of cases worldwide were recorded in Pakistan, which risks being the last country to interrupt transmission, and so is jeopardizing global polio eradication. In July, 2011, cases of poliomyelitis identified in children in the western region of China (Xinjiang autonomous region) were genetically linked to cases in Pakistan, showing the risk to other countries of poliomyelitis in Pakistan.

Since the turn of the century there have been several developments in the GPEI strategy. Until 2005, GPEI relied on the trivalent form of the oral poliovirus vaccine (OPV), which contains all three serotypes.

Use of trivalent OPV results in reduced effectiveness against individual serotypes, in particular serotypes 1 and 3, because of interference between Sabin vaccine strains.⁴ To address this problem, serotype 1 and 3 monovalent OPVs were produced and licensed in 2005 (wild-type poliovirus serotype 2 was eliminated in 1999). These vaccines are more immunogenic and more effective than the trivalent vaccine. In late 2009 and early 2010, a serotype 1 and 3 bivalent OPV was licensed and pre-qualified by WHO and introduced into Pakistan after its immunogenicity was shown to be non-inferior compared with monovalent OPV for each serotype in a study among neonates in India.

Since the introduction of these improved vaccines to Pakistan, One would have expected a reduction in cases. However, polio eradication in Pakistan has been affected by weak service delivery and was identified by the GPEI Independent Monitoring Board in 2010 as a country that was not on track for elimination of poliomyelitis. The eradication of poliomyelitis in parts of Pakistan has been complicated by armed conflict, security concerns (e.g. areas being inaccessible to vaccination teams because of security concerns, and the movement of families to escape potential conflict), cultural barriers, and natural disasters that have limited accessibility of vaccination teams to target populations. Because of the deterioration of the program in Pakistan in 2011, on Jan 21, 2012, the WHO Executive Board declared polio eradication a “programmatically emergency for global public health

Because poliovirus remains endemic in Pakistan, identifying where the program is failing to immunize children is imperative, so that appropriate improvements to the vaccination program can be made. Although independent monitoring of immunization campaigns can provide an estimate of coverage, these data do not easily translate to estimates of serotype-specific immunity. Furthermore, recent lot quality assurance sampling of vaccination coverage during campaigns suggested that independent monitoring might significantly overestimate coverage.

Pakistan is one of the three remaining countries yet to interrupt wild-type polio virus transmission and its eradication is likely to yield substantial health and financial benefits. The increasing incidence of poliomyelitis in Pakistan in 2010-2011 led the executive board of WHO in January 2012 to declare polio eradication a “programmatically emergency for global public health”. We aimed to establish why incidence is rising in Pakistan despite program innovation.

METHODOLOGY:

We did a descriptive study with proper informed consent from all the hundred people having formal interviews for ten minutes randomly from May-September 2012 from the OPD's in the DHQ's of various districts of Punjab and Khyber Pukhtoonkhwa(Rawalpindi, Sialkot, Sargodha, Multan, Gujrat, Peshawar, Tarbela and Abbottabad). All the team members filled the questionnaires themselves by having interviews from the people selected randomly having children

of < 5 years in their family and for evaluating routine OPV coverage, a standardize questionnaire consisting of socio-demographic information, immunization status and related characteristic was used in these face to face interviews and household setting. It took 10 minutes to fill full out the questionnaire by response of child care takers (mother if possible). For evaluating the quality of the service delivered, questionnaires were filled by the polio team members.

The individual session summary notes were prepared and later synthesized, Consolidated and subjected to conceptual analysis which showed the economic implications of a change in policy from eradication to control.

RESULT:

A total of 100 structured questionnaires filled by the public from different districts of Punjab and Khyber Pukhtoonkhwa (Sialkot, Sargodha, Rawalpindi, Multan, Gujarat, Peshawar, Tarbela and Abbottabad) were included in the study. Out of the 100 people who were included in the study, 86% of them had children < 5 years of age in their families, that is they had some knowledge about the EPI schedule of Pakistan (table 1). 96% of the total children took polio drops every time the campaign occurred because the polio team ensured that they reached every house during the campaign i.e. the coverage by them was 100% (table 3 and 7). At birth 93% of the babies were given the polio drops however the percentage of taking polio drops increased to 96% that means that people were made fully aware of the

time to time campaign but they had no sound knowledge of giving polio drops at birth (table 5 and 3). According to the study, even though only 19% of people believed that they might get polio disease by taking polio drops yet in the circumstances when the child was ill only 78% of people would allow their child to take OPV (table 4 and 17). Majority of the people are well aware of the EPI schedule and 97% of them had completed vaccination of their child (table 6). Due to the mass coverage of the polio campaign, the workers go to every door-step and the efforts of Government should be appreciated for that (table 7 and 10) but due to the people's own negligence about their child if due to any particular reason the team does not reach the people then 37% of people even don't make an effort to inform the relevant authorities and 20 % are those who didn't take their child to a nearby health center (table 8 and 9). 94% of the people are well informed every time before the start of the campaign due to the exhaustive publicity measures taken by the Government (table 12). In the past, due to the polio caused by the strain serotype 3 to the already vaccinated child for polio, this led to the misconception that giving polio drops may cause the disease, the belief is still having its deep foundations in the minds of illiterate people as 16% people shared the same concept (table 16). In the long run, Pakistan is lagging far behind other countries in eradicating polio, so the Government is putting their great efforts and interest in the campaigns of Polio eradication. About 96 % of people were satisfied by the efforts taken by the Government and 92% believed that if all the children of Pakistan < 5 years of age were

vaccinated properly, Pakistan will also become a POLIO-FREE nation. (table 18 and 19).

The association between the concept of the people that giving polio drops to an ill child can have adverse effects on his health and the situation that polio drops are taken by the child even when he is ill was found to be significant on application of Pearson-Chi-Square test and it was less than 0.01. Similar association was found between child taking the polio drops during every campaign and the concept of the people that polio can be completely eradicated by giving polio drops to every child of less than 5 years of age. It was also less than 0.01, hence significant.

DISCUSSION:

Basic aim of the study was to highlight the major causes for the failure of polio eradication in Pakistan, despite of the fact that other countries have achieved a polio-free nation. Given that polio eradication necessitates almost complete vaccination coverage, unclear communication about vaccination policy seems to have been problematic amongst study participants. Increased transparency and an adverse-effects compensation program may need to be considered to build more trust with the public in future programs.

Intensification of the polio program and lack of transparency about the use of monovalent vaccine seemed to contribute to “resistance” to the program. The public has not been given adequate explanations as to why the polio eradication program is vaccinating every child every month. From

the data, it is apparent that this may have contributed to fatigue, if not suspicion of the program. Because the public was uninformed of the strategy to eradicate P1 first as well as differences between P1 and P 3 strains of polio virus, when P3 cases occurred, many saw a “polio case” generically and came to doubt the efficacy of OPV. Simultaneously, the dearth of this information deprived public of the choice to vaccinate against P3, potentially breaching trust between the patient and provider, as qualitatively was the case with the family in Abbottabad whose child developed polio-like conditions despite vaccinating regularly. These families deserved to know what medications they were, or were not being able to provide for their children.

During the course of this study, it was also found that there were rampant rumors that the OPV caused children to develop fevers, sickness, acute flaccid paralysis, or even die. There are three possible causes for these beliefs: that they were coincidental, that they were cases of VAPP (vaccine associated paralytic polio), or that they were cases of P3.

However, the fact that the vaccination teams usually told people that the vaccine was completely safe made these individuals further doubt the program. This explanation to the public is problematic, if not dishonest. With all vaccines, there is some inherent amount of risk. The OPV, as a live attenuated vaccine, carries the risk of causing either fever, mild body aches, or even full- fledged paralysis if the virus reverts.

Though the policies of not disclosing the risks associated with OPV vaccination or explaining the monovalent strategy were initially done to avoid confusion and achieve high levels of vaccination, if trust with the public was affected, it would have been important to increase policy transparency and improve information, education, and communication activities.

Risk perception studies indicate that the public “will accept risk from voluntary activities that are roughly 1000 times as great as it would tolerate involuntary risks,” highlighting the importance to increase active demand for the vaccine. The Ottawa and Bangkok charters for Health Promotion advocate for increases in health literacy as a means for improving public control over all modifiable determinants of health. With increased health literacy, communities are often better able to determine what is best for their well-being, and advocate for programs like vaccination.

An additional concern with the current strategy is that of medical ethics. Of the four medical principles, justice, beneficence, non-maleficence, and autonomy, not informing the public of the small risks associated with OPV vaccination may impinge on the principle of autonomy: “giving patients the right to make their own choices”. If patients are compelled to make a decision without access to information which could be provided, it would prove problematic. The same issue would be the case with a dearth of information about the vaccination strategy.

Since 2006, there has been a decrease in estimated vaccination coverage and population immunity against poliomyelitis in specific regions of Pakistan, which correlated with an increased incidence of cases. In response to this epidemiological situation, the President of Pakistan launched a National Emergency Action Plan in early 2011. Part of this action plan included a focus on 33 districts with a high incidence of poliomyelitis, largely in KP, FATA, Baluchistan, and Sindh. In late 2011, the National Emergency Action Plan was further augmented with tighter oversight and vigorous monitoring to improve quality in vaccination campaigns. However studies suggest that vaccination coverage continued to decrease in 2011, especially in Baluchistan. Additionally, coverage continues to be compromised by the ongoing conflict in southern Afghanistan.

Immunization is not the only intervention with inequitable access in Pakistan, but poor access to it contributes with other social determinants to poor child health in these areas. Armed conflict and concerns about security are major challenges that can limit access to children during vaccination campaigns, in addition to disrupting routine health and immunization services. Routine immunization decreased in Baluchistan and FATA in Pakistan, with just 25–33% of children under 3 years old reported to have received three or more doses of OPV through routine services in 2011. However, weak service delivery has also resulted from poor management and scarcity of local accountability; even so, polio has been successfully eliminated during times of

conflict in many other countries. To achieve this ambitious goal, major improvements in vaccination delivery will be needed in the face of armed conflict and concerns about security.

The respondents indicated the poor condition of cold-chain equipment especially at peripheral level. No public health training school exists for vaccinators before their induction into the health services. Lack of regular training and essential skills among EPI staff at all levels, need to sanction more supervisory posts and lack of public health personnel, unreliability of reporting and poor monitoring systems is highlighted..

So above all, the literacy level of Pakistan is too low and so people under-estimate the importance of vaccinating their child. Despite of the efforts from the Government, it's the people who are less aware, less conscious about the polio campaigns and are least interested in even vaccinating their child.

RECOMMENDATIONS:

The following recommendations may help to improve polio eradication efforts in Pakistan:

- Cold chain equipment should be updated and maintained on a regular basis. Air-conditioned vehicles should be made available in all district headquarters. Electricity and security problems should be addressed and the vaccination point for a union council should be at the respective health center. Reserve stocks of essential EPI equipment and supplies should be maintained at the district stores.

- District health managers should be authorized and trained in resource allocation and human resource management.

- Advocacy and communication resources should be decentralized and districts should design their advocacy, communication and social mobilization strategies according to the local circumstances.

- There should be training schools for vaccination staff, before their induction in each district. These schools could also be used for further training of EPI staff, which should be mandatory for their promotion. Focused training programs, held bi-annually, should be initiated for EPI staff at all levels. All relevant staff should be trained in face-to-face individual and group communication skills, and in techniques for using printed material with the clients.

- District health departments should be authorized to make resource management and staffing decisions. The provision of incentives to young medical graduates for joining public health services and establishing national public health services is also recommended.

- Administrative measures, including appraisal of excellent performance, redefining vaccination areas based on a 10

kilometers radius and/or 15,000 inhabitants rather than revenue circles, and making flexible vaccination field plans should be instituted. The posts EPI Focal Person in a district and rural health centers should be sanctioned. A law for birth registration with health facilities should be constituted and a birth register should be maintained by Lady Health Visitors. This could significantly increase OPV zero-dose coverage. The linkage between preventive programs should be improved. There should be a mechanism in place to ensure accessibility of immunization cards to vaccinators and monitoring personnel, and immunization cards could be declared mandatory for admission to the schools.

- The staff at all levels in the EPI should be trained to improve monitoring, data quality assessment and the use of data for action. Staff should be encouraged to do realistic reporting, and records should be computerized and integrated with the district health management information system (DHMIS).

- District health departments should be made more resourceful in monitoring, evaluation, and financial matters and clear guidelines for the roles and responsibilities of officials at every level from the center to the districts should be developed.

CONCLUSION:

The study highlights various shortcomings and bottlenecks in the EPI, and the barriers

identified should be considered in prioritizing future strategies. Focusing on the large costs for poliomyelitis eradication, without assessing the even larger potential benefits of eradication and the enormous long-term costs of effective control, might inappropriately affect commitments to the goal of eradication.

ROLE OF THE FUNDING SOURCE:

No funders have any role in the study design, data collection, data analysis, data interpretation, decision to publish, or preparation of the manuscript. The corresponding authors had full access to all the data in the study and had final responsibility for the decision to submit for publication.

LIMITATIONS:

Due to the ethnographic approach to the study, in addition to the manual coding of the data, this study is subject to researcher's bias. Selection bias may have occurred due to the relatively large yet unspecified number of participants who were illiterate or didn't had sound knowledge about the Polio campaign or didn't have children less than 5 years at their homes . Additionally, as not all interviews were completely transcribed, the full scope of views shared by participants may not have been acknowledged. Nevertheless, the study provides insight into views and attitudes toward vaccination and the causes of failure of polio eradication .

S.No.	Variable	N	Mean	Std. Deviation	Sum
1.	Are there any children <5 years of age	100	.86	.349	86
2	Does your child take polio drops?	100	.94	.239	94
3	Does your child take it every time?	100	.96	.197	96
4	Does your child take polio drops even when he is ill?	100	.78	.416	78
5	Has your every child taken polio drops at time of birth?	100	.93	.256	93
6	Have you completed the vaccination course of your child?	100	.97	.171	97
7	Do the polio teams come to your house?	100	1.00	.000	100
8	If the polio team does not reach your area or house in time do you inform on the provided telephone numbers or nearby health center?	100	.63	.485	63
9	If by any chance your child could not get polio drops during a campaign do you take him/her to nearby health center?	100	.80	.402	80
10	Does the polio team behave positively?	100	1.00	.000	100
11	Do you cooperate with the polio team?	100	.99	.100	99
12	Are you well informed every time before the start of a polio campaign that is through T.V, radio, newspapers, announcements in the mosques or posters?	100	.94	.239	94
13	Do you know it is necessary that every child gets a black mark on his little finger after taking polio drops?	100	.94	.239	94
14	Is anyone suffering from polio in your family?	100	.16	.368	16
15	In your opinion the biggest cause of polio is that polio drops are not taken by children?	100	.88	.327	88
16	Do you think giving polio drops to an ill child can have adverse effects on his health?	100	.16	.368	16
17	Do you believe that a child can get polio disease by taking polio drops?	100	.19	.394	19
18	If by any chance your child could not get polio drops during a campaign do you take him/her to nearby health center?	100	.80	.402	80
19	Are you satisfied with efforts of the government and other health organizations for eradication of polio in Pakistan?	100	.96	.197	96

Frequency Tables

Table 1: Are there any children <5 years of age?

		Frequency	Valid Percent
	No	14	14.0
	Yes	86	86.0
	Total	100	100.0

Table 2: Does your child take polio drops?

		Frequency	Valid Percent
Valid	No	6	6.0
	Yes	94	94.0
	Total	100	100.0

Table 3: Does your child take it every time?

		Frequency	Valid Percent
Valid	No	4	4.0
	Yes	96	96.0
	Total	100	100.0

Table 4 : Does your child take polio drops even when he is ill?

		Frequency	Valid Percent
Valid	No	22	22.0
	Yes	78	78.0
	Total	100	100.0

Table 5: Has your every child taken polio drops at time of birth?

		Frequency	Valid Percent
Valid	No	7	7.0
	Yes	93	93.0
	Total	100	100.0

Table 6 : Have you completed the vaccination course of your child?

		Frequency	Valid Percent
Valid	No	3	3.0
	Yes	97	97.0
	Total	100	100.0

Table7:Do the polio teams come to your house?

		Frequency	Valid Percent
Valid	Yes	100	100.0

Table 8:If the polio team does not reach your area or house in time do you inform on the provided telephone numbers or nearby health centre?

		Frequency	Valid Percent
Valid	No	37	37.0
	Yes	63	63.0
	Total	100	100.0

Table 9: If by any chance your child could not get polio drops during a campaign do you take him/her to nearby health center?

		Frequency	Valid Percent
Valid	No	20	20.0
	Yes	80	80.0
	Total	100	100.0

Table 10: Does the polio team behave positively?

		Frequency	Valid Percent
Valid	Yes	100	100.0

Table 11: Do you cooperate with the polio team?

		Frequency	Valid Percent
Valid	No	1	1.0
	Yes	99	99.0
	Total	100	100.0

Table 12: Are you well informed every time before the start of a polio campaign that is through T.V, radio, newspaper, and announcements in the mosques or posters?

		Frequency	Valid Percent
Valid	No	6	6.0
	Yes	94	94.0

	Total	100	100.0
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Table 13: Do you know it is necessary that every child gets a black mark on his little finger after taking polio drops?

		Frequency	Valid Percent
Valid	No	6	6.0
	Yes	94	94.0
	Total	100	100.0

Table 14: Is anyone suffering from polio in your family?

		Frequency	Valid Percent
Valid	No	84	84.0
	Yes	16	16.0
	Total	100	100.0

Table 15: In your opinion the biggest cause of polio is that polio drops are not taken by children?

		Frequency	Valid Percent
Valid	No	12	12.0
	Yes	88	88.0
	Total	100	100.0

Table 16: Do you think giving polio drops to an ill child can have adverse effects on his health?			
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		Frequency	Valid Percent
Valid	No	84	84.0
	Yes	16	16.0
	Total	100	100.0

Table 17: Do you believe that a child can get polio disease by taking polio drops?

		Frequency	Valid Percent
Valid	No	81	81.0
	Yes	19	19.0

	Total	100	100.0
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Table 18: Do you think polio can be completely eradicated by giving polio drops to every child under 5 years of age?

		Frequency	Valid Percent
Valid	No	8	8.0
	Yes	92	92.0
	Total	100	100.0

Table 19: Are you satisfied with efforts of the government and other health organizations for eradication of polio in Pakistan?

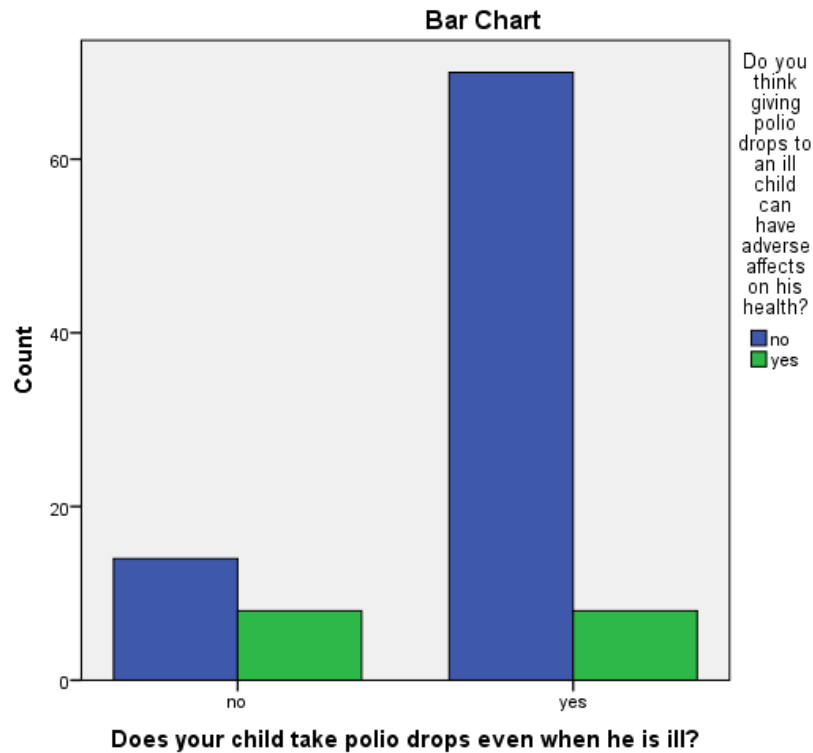
		Frequency	Valid Percent
Valid	No	4	4.0
	Yes	96	96.0
	Total	100	100.0

Does your child take polio drops even when he is ill? * Do you think giving polio drops to an ill child can have adverse effects on his health?				
Cross tabulation count				
		Do you think giving polio drops to an ill child can have adverse effects on his health?		Total
		no	yes	
Does your child take polio drops even when he is ill?	no	14	8	22
	yes	70	8	78
Total		84	16	100

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.702 ^a	1	.003		
Continuity Correction ^b	6.868	1	.009		
Likelihood Ratio	7.507	1	.006		
Fisher's Exact Test				.007	.007
Linear-by-Linear Association	8.615	1	.003		
N of Valid Cases	100				

a). 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.52.

b). Computed only for a 2x2 table



Does your child take it every time? * Do you think polio can be completely eradicated by giving polio drops to every child under 5 years of age?

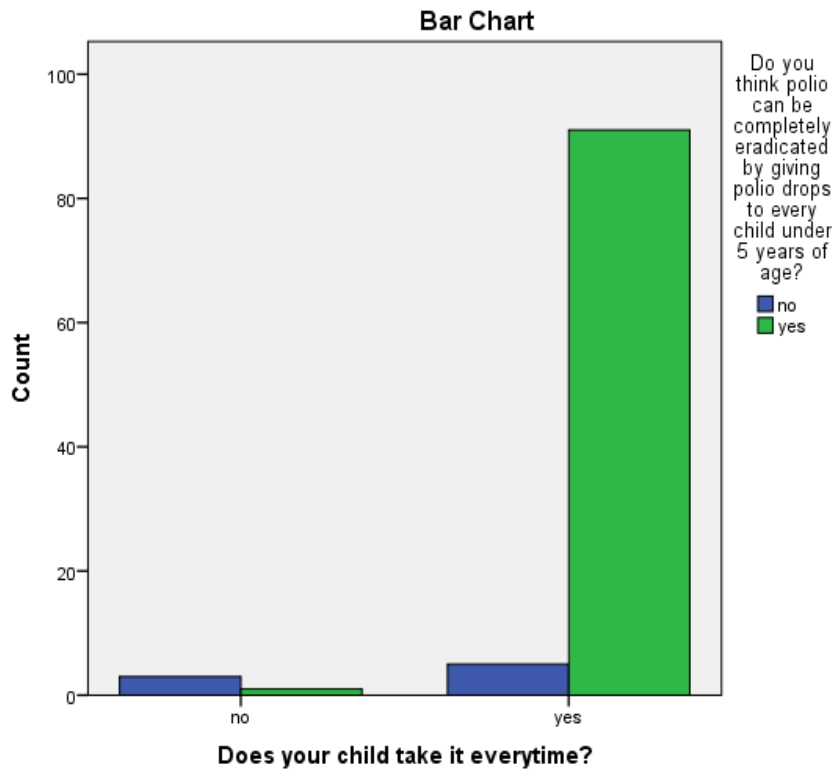
Cross tabulation count

		Do you think polio can be completely eradicated by giving polio drops to every child under 5 years of age?		Total
		no	Yes	
Does your child take it every time?	no	3	1	4
	yes	5	91	96
Total		8	92	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	25.413 ^a	1	.000		
Continuity Correction ^b	16.815	1	.000		

Likelihood Ratio	11.971	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	25.159	1	.000		
N of Valid Cases	100				
a). 2 cells (50.0%) have expected count less than 5. The minimum expected count is .32.					
b). Computed only for a 2x2 table					



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