

## Adverse Events Following Immunisation (AEFI) Surveillance in Kwekwe District, Midlands Province, Zimbabwe, 2009-2010

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### Abstract

**Introduction:** The outpatient surveillance system in Kwekwe district reported 86 AEFI cases in 2009. No surveillance forms were completed for these cases. This study was therefore conducted to identify reasons for this anomaly.

**Methods:** Interviewer administered questionnaires were used to collect data on knowledge, usefulness and system attributes from health workers and caregivers of under-fives who were found at 18/33 health facilities in the district.

**Results:** None of 61 nurses interviewed could correctly define an AEFI. AEFI notification and investigation forms were available at 6/18 health facilities. None of the health facilities had AEFI case definitions displayed. Reasons for failure to notify cases included lack of training on the system 56(91.8%), unavailability of stationary 43(70.5%) and mothers not knowledgeable on AEFIs 21(34.6%). The surveillance system was found to be acceptable.

**Conclusion:** Lack of knowledge on AEFI surveillance procedures was the main challenge. As a result, 150(45%) nurses were trained in AEFI surveillance and surveillance forms were distributed to all health facilities.

**Keywords:** Adverse events; Immunizations; Surveillance

### Introduction

The World Health Organisation (WHO) defines an adverse event following immunisations (AEFI) as a medical incident that takes place after an immunisation, causes concern and is believed to be caused by immunisation [1,2]. AEFI may be caused by a vaccine(s) or may occur coincidentally. Adverse events following immunisations are classified into five main categories which are vaccine reactions, programme errors, coincidental events, injection reactions and unknown events [3,4].

The World Health Organisation (WHO) has developed generic guidelines for AEFI surveillance that can be adapted to local resources and systems. Reporting is usually case-based however active surveillance based on search for selected medical events can be useful for specified events [5-7].

The overall goal of an AEFI surveillance system is early detection and appropriate prompt response to adverse events in order to lessen negative impacts on immunisation programs and the health of vaccines [8,9].

Zimbabwe was among the sixty six countries that had been trained in AEFI surveillance by the WHO Global Training Network as at July 2004.

Kwekwe District has an AEFI surveillance system which is in line with the Zimbabwean Ministry of Health's expectations. The T5

surveillance system for Kwekwe district picked up 86 AEFI cases in 2009 however no notification or case investigation forms were completed and sent to provincial managers. The number cases reported by the district often did not tally with the ones captured in the Provincial health information data base. We therefore evaluated the AEFI surveillance system for Kwekwe district to assess its functionality.

### Materials and Methods

A descriptive cross-sectional study was conducted in Kwekwe district. Fifteen of twenty nine clinics and all three hospitals in the district were selected. Health workers involved in the system and caregivers of under 5s were interviewed. The district nursing officer, community health nurse and district medical officer were key informants.

Interviewer administered questionnaires were used to obtain information from all study participants to assess their knowledge on the operations and usefulness of the system. Notification and investigation forms from January 2009 to June 2010 were reviewed to check for simplicity, flexibility, data quality, completeness and timeliness of the system. A checklist was used to assess the system's stability and availability of resources for the surveillance system.

Epi Info version 3.5.1. was used to collect and analyse data. Logic checks were performed during data entry. Frequencies and proportions of different variables were generated and reported while means/medians of some variables were reported with their relevant

measures of central tendency. Permission to carry out the study was sought from the Health studies office, Provincial Medical Director, Midlands Province and the District Medical Officer, Kwekwe. Written informed consent was obtained from all study participants.

## Results

A total of 61 health workers were interviewed. A majority were female 44 (72.1%) and were registered general nurses (RGNS) 28 (45.9%). Their median years in service was 5 (Q<sub>1</sub>=3, Q<sub>3</sub>=15) and median age was 33 (Q<sub>1</sub>=28, Q<sub>3</sub>=42). Table 1 summarises the demographic characteristics of the health workers.

Variable	Categories	Total number n=61	%
Sex	Male	17	27.9
	Female	44	72.1
Designation	Registered general nurse	28	45.9
	Primary care nurse	15	24.6
	State certified nurse	3	4.9
	Nurse Aide	15	24.6
Responsible Authority	Government	25	41
	Mission	2	3.3
	Rural district council	23	37.7
	Urban local authority	11	18
Years service	in Median years in service = 5 Q <sub>1</sub> =3 ; Q <sub>3</sub> =15		
Age	Median age = 33 Q <sub>1</sub> =28 ; Q <sub>3</sub> =42		

**Table 1:** Demographic Characteristics of Health Workers; Kwekwe 2010.

Majority of caregivers were female 88 (95.7%) with most of them being mothers of the index child (youngest child at home) 82 (89.1%). Most caregivers had attained secondary education 61 (66.3%) and their median age was 25 years. Table 2 summarises the demographic characteristics of the caregivers of under 5s.

Variable	Category	Total number (N=92)	%
Sex	Female	88	95.7
	Male	4	4.3
Relationship to child	Mother	82	89.1
	Father	4	4.3
	Caregiver/guardian	6	6.5
Level of education	None	4	4.3
	Primary	27	29.3
	Secondary	61	66.3
Age	Median age = 25		

	Q1=22 Q3 = 30		
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**Table 2:** Demographic Characteristics of caregivers/mothers/guardians of under 5s; Kwekwe 2010.

None of the health workers could correctly define an AEFI. Eighty percent of the health workers knew the number of forms filled on notification and reporting AEFIs while 37(60.7%) knew the correct notification period for a serious AEFI case.

Almost half of the caregivers (52%) knew at least three vaccine preventable diseases, (45.7%) knew at least two possible presenting symptoms of AEFIs and less than half (43.5%) had received previous education on AEFIs.

Of the 61 health workers interviewed, 54 (88.5%) reported that completing AEFI surveillance forms was part of their duty while 57 (95%), were willing to continue participating in the system.

Only 9 (14.8%) of the health workers reported having ever filled AEFI notification and investigation forms respectively. Of the nine who had previously completed the forms 5 (55.6%) indicated that filling in the forms was not time consuming as they needed less than 10 minutes to do so. Most (91.8%) health workers however reported that they needed special training to be able to fill in the forms correctly.

Thirty of 61 health workers had ever seen the notification and investigation forms and they all reported that the forms are flexible since they have space for additional information to be added.

Six percent (6%) of the health workers had received training on AEFI surveillance. Eighteen (29.5%) of the health workers reported that AEFI surveillance forms were available at their health facilities and on physical checking, the forms were available at health facilities. Most (65.6%) health workers indicated that they used the telephone to communicate with the district. Nine(14.8%) of the health workers reported having an AEFI case definition at their health facility however on physical checking none was found at all health facilities.

The majority of the health facilities were rural health centres (10/18) and 2 of the 3 hospitals were government institutions while the other hospital was a mission hospital. Private health institutions were not taking part in the surveillance system.

Data quality could not be assessed because there were no forms filled during the period under review.

A total of 86 AEFI cases were reported on the T5 surveillance system in 2009 and no cases were reported in the district from January to June 2010. There was no other source of information on suspected AEFI cases to give an overview of the total number that occurred in the district for the period under review apart from those captured on the T5. As a result the system sensitivity for the district could be conclusively measured.

Timeliness and completeness could not be assessed because there were forms filled during the period under review.

Key informants reported that the system was useful to the district. The information obtained from the system was reported to be used to improve planning, to educate the community and for vaccine efficacy monitoring and evaluation. Majority of the health workers (98.4%) indicated that the system was useful. Although 39.3% of the health workers indicated that they were holding AEFI surveillance

meetings none of them could provide minutes as proof of such meetings having been held.

Seven (11.5%) of the health workers reported that they had attended to mothers reporting an AEFI in the year 2010 however only 2/7 of the health workers reported notifying the cases. The reasons reported for not notifying cases included not knowing the reporting procedure, fear of causing unnecessary alarm and unavailability of stationary for reporting the cases.

Forty three (71.7%) of health workers reported that they did not receive feedback from the upper levels on AEFI surveillance. The provision of a third nurse to rural health centres was reported to be necessary in order to improve the system. Only 6/18 health centres had paediatric resuscitation equipment in their vaccination rooms. 13/18 health centres had functional telephones which they used to communicate with the next level. None of the health centres had AEFI case definitions or reporting procedures displayed.

## Discussion

Health workers' knowledge on the operations of the AEFI surveillance system and some fundamental variables such as AEFI case definition was very low. Most health workers also did not know the reporting procedures for AEFI surveillance. Lack of knowledge of the system in Kwekwe district could have contributed to poor reporting resulting in there being no forms completed for the 86 cases reported by the T5 surveillance system in the district in 2009. If health workers do not know the AEFI case definition for example they may encounter an AEFI case and make the wrong diagnosis thereby failing to report it as such. This then leads to underreporting of cases occurring in that particular community [10].

This is supported by findings from a study by Pfute et al. to evaluate the AEFI surveillance system in Matebeleland North in 2006 [11]. Their results showed that low AEFI surveillance knowledge among health workers threatens detection of AEFI cases, management and EPI coverage in general. Similar findings were also reported by Ernest et al in their study on knowledge and practices of health workers in AEFI surveillance system [12] who reported that health workers who are not knowledgeable about the surveillance system contribute very little to the general welfare of the children and the system itself.

The majority of health workers had never received any training on AEFI surveillance and reporting procedures. This greatly compromises case detection and the whole investigation process. This is supported by a study done in Nepal which showed that half of the health workers who were involved in the surveillance system were not familiar with how forms were filled and the investigation process itself [13]. Studies done in the US and Canada also revealed similar findings since they showed that a significant proportion of physicians were unaware of the reporting system, did not know how to report or were reluctant to report adverse events following vaccine administration [14] hence continuing education programmes about the need to report and how to report adverse events have been noted to be necessary to achieve great success in AEFI reporting [15].

Most caregivers/ mothers of under 5s had limited knowledge of AEFIs. Poor knowledge among caregivers greatly compromises system sensitivity since the surveillance system is passive and solely depends on the caregivers to report cases to the health centres.

Findings from a study done in Uganda to assess parents/caretakers' perceptions and concerns about vaccine safety showed that caregivers

were knowledgeable about benefits of immunisation but not on AEFIs [16]. Contrary to these findings however Performance Assessment of Health Workers training in Routine Immunisation in India in 2005 revealed that 71.1% of caregivers had good knowledge on minor AEFIs and 55.6% knew how to handle these [17].

Majority of health workers acknowledged that it was their duty to fill in notification and investigation forms and were willing to continue participating in the surveillance system. Their willingness however was compromised by unavailability of surveillance stationary at most health centres. Unavailability of stationary or inability to find reporting forms has been identified in other studies as a major barrier in peripheral health workers' reporting of AEFIs [18].

A majority of all participants however indicated that special training was required for them to be able to fill in these forms correctly. This general perception among health workers that the system is not simple and may lead to reluctance to initiate the notification process.

Lack of previous training on AEFI surveillance among health workers, poor transport and communication systems threatened the stability of the system. Poor communication systems mean surveillance information cannot be relayed as timely as it should be. Among other gaps reported in other studies were lack of transportation and other means of communication which resulted in failure to report cases by health workers [19].

The reasons given for failure to report cases were lack of knowledge on reporting procedure, unavailability of stationary and fear of causing alarm. Other studies have reported not knowing the reporting process, inability to find forms, fear that reports will lead to personal consequences, guilt about having caused harm and being responsible for the event as barriers to reporting [18].

Representativeness was threatened by private health institutions not reporting. This could also be worsened by lack of knowledge among health workers in the private sector on reporting and the AEFI surveillance system in general.

The system was reported by most health workers to be useful however a minority of the participants had ever held any meetings on AEFI surveillance in the district. These findings indicate that though the majority of health workers reported the system to be useful its usefulness is not evidenced by action taken based on it. This poses a threat to usefulness of the system and could be improved if health workers were trained on the system.

Dembedza et al. in their study on assessment of the AEFI surveillance system in Zaka district in 2008 also showed that apart from health workers reporting the system as useful no data was captured at the clinics on AEFIs and no public health action was taken at local level based on AEFI surveillance data [20].

Health workers' knowledge on the operations of AEFI surveillance system was low in Kwekwe district. The system was found to be acceptable, useful and flexible but not representative, simple nor stable. The sensitivity of the system could not be conclusively measured. The system was reported by most participants to be useful and this could be further improved by training health workers in the system. There were inadequate resources to run the system in the district. Reasons for failure to notify cases by the health workers included lack of knowledge on the reporting procedure, unavailability of stationary, fear of causing alarm in the community and failing to identify event as being related to immunisation. The District Medical

Officer needed to send health workers for training on AEFI surveillance, ensure adequate supply of AEFI surveillance stationary, ensure meetings are held regularly and source adequate resources for AEFI surveillance.

## References

1. WHO (2014) Polio vaccines: WHO position paper, January 2014 - Recommendations. *Vaccine*.
2. WHO (1997) Surveillance of Adverse Events Following Immunisation: Field Guide for Managers of Immunisation Programmes.
3. Clothier HJ, Crawford NW, Kempe A, Buttery JP (2011) Surveillance of adverse events following immunisation: the model of SAEFVIC, Victoria. *Commun Dis Intell Q Rep* 35: 294-298.
4. WHO (1999) Immunization Safety Surveillance: Guidelines for Managers of Immunization Programmes on Reporting and Investigating Adverse Events Following Immunization.
5. Pan American Health Organization (2002) Immunisation Safety.
6. WHO (2007) Global Framework for Immunisation Monitoring and Surveillance.
7. Joint Reporting Form, April 2004, JRF- UNICEF-WHO.
8. Ministry of Health and Family Welfare (2004) Guidelines for Reporting and Management of Adverse Events Following Immunisations.
9. WHO (2010) Adverse Events Following Immunisations in a Changing Immunisation Environment.
10. Ministry of Health and Child Welfare (2005) Zimbabwe Expanded Programme on Immunisation, Policy Document.
11. Pfute (2006) An evaluation of the Adverse Events Following Immunisations Surveillance System in Matebeleland North Province, Zimbabwe.
12. Ernest SK (2002) Injection safety: knowledge and practice among health workers. *West Afr J Med* 21: 70-73.
13. Bhattarai MD, Adhikeri IP, Kane A, Uprely T, Witter S (2001) Rapid Assessment of Perceptions, Knowledge and Practices related to Immunisation Injection Safety in Nepal, 2001. Joint report of Ministry of health Nepal, UNICEF and USAID 1-35.
14. Duclos P1, Hockin J, Pless R, Lawlor B (1997) Reporting vaccine-associated adverse events. *Can Fam Physician* 43: 1551-1556, 1559-60.
15. Miller M1, Turner N (2002) Suggestions for improving the monitoring of adverse events following immunization in New Zealand. *N Z Med J* 115: U186.
16. Asiimwe D, Kibombo R, Matsiko J (2006) Vaccine Safety Perceptions among Parents in Developing Countries and Influence of Adverse Events Following Immunisations on their Decision to Vaccinate Children.
17. Deoki N, Hamid J, Utsuk D, Sumil B, Renu Pa, et al. (2009) Performance Assessment of Health Workers training in Routine Immunisation in India, 2009. WHO and NIHFW collaborative study.
18. WHO (2013) Immunization safety surveillance: guidelines for immunization programme managers on surveillance of adverse events following immunization.
19. Lippeveld T, Sauerborn R, Bodart C (2000) Design and Implementation of Health Information Systems. WHO Library cataloguing in Public Data.
20. Dembedza E, Mudyiradima RF, Ndlovu N, Shambira G (2008) An Assessment of the Adverse Events Following Immunisation Surveillance system in Zaka District, Masvingo Province, Zimbabwe.