

Table 4. Determinants of adherence to TB treatment in DOTS facilities

Explanatory Variables	Model 1	Model 2	Model 3
	OR [95%CI]	OR [95%CI]	OR [95%CI]
<b>Age and gender combination<sup>1</sup></b>			
male aged under 30yrs	1.69 [0.49-5.80]	1.98 [0.54-7.23]	1.61 [0.40-6.44]
female aged under 30yrs	<b>4.46 [1.03-19.36]</b>	4.14 [0.91-18.94]	2.87 [0.57-14.40]
male aged 30-44yrs	1.87 [0.56-6.22]	1.84 [0.53-6.39]	1.11 [0.30-4.18]
female aged 30-44yrs	<b>13.16 [2.24-77.20]</b>	<b>10.14 [1.68-61.11]</b>	<b>6.69 [1.08-45.40]</b>
male aged 45-59yrs	<b>3.77 [1.08-13.14]</b>	<b>3.86 [1.05-14.15]</b>	2.18 [0.54-8.77]
female aged 45-59yrs	<b>7.40 [1.29-42.49]</b>	<b>6.45 [1.08-38.38]</b>	5.45 [0.84-35.26]
male aged over 60yrs	2.17 [0.62-7.63]	1.88 [0.51-7.01]	1.33 [0.32-5.47]
<b>Educational Level<sup>2</sup></b>			
Primary level and below	0.81 [0.31-2.11]	0.83 [0.30-2.33]	1.03 [0.34-3.09]
Secondary level	0.94 [0.40-2.19]	0.85 [0.35-2.08]	0.98 [0.38-2.53]
<b>Working status<sup>3</sup></b>			
Professional	0.45 [0.18-1.10]	<b>0.34 [0.13-0.86]</b>	0.46 [0.17-1.21]
Sell/ service/skilled labor	1.64 [0.19-14.53]	1.72 [0.19-15.56]	2.04 [0.19-21.33]
Self-employed/other	<b>0.33 [0.15-0.75]</b>	<b>0.33 [0.14-0.76]</b>	<b>0.35 [0.15-0.83]</b>
<b>Log of Household Income per Capita</b>	<b>1.49 [1.05-2.13]</b>	1.40 [0.97-2.02]	<b>1.61 [1.08-2.40]</b>
<b>Knows the cause of TB</b>		1.47 [0.71-3.04]	1.47 [0.69-3.17]
<b>Knows how TB is transmitted</b>		<b>1.84 [0.99-3.43]</b>	1.42 [0.73-2.78]
<b>Presence of at least 1 sign/symptom</b>		<b>6.05 [1.76-20.74]</b>	<b>4.65 [1.23-17.51]</b>
<b>Experienced Side effect of Drug<sup>4</sup></b>			
Having side effect and explanation provided by HW*			1.03 [0.48-2.22]
Having side effect but no explanation provided by HW			0.74 [0.28-1.94]
<b>Place of treatment and treatment partner<sup>5</sup></b>			
Health facility and having treatment partner			<b>4.14 [1.60-10.74]</b>
Home and having treatment partner			1.20 [0.54-2.66]
<b>Patients' Knowledge of DOTS</b>			
<b>-2 Log likelihood</b>	297.99	283.64	255.51
<b>Prob &gt;Chi<sup>2</sup></b>	.001	.000	.000
<b>R<sup>2</sup></b>	0.146	0.204	0.312

All values in bold font are statistically significant at  $p < 0.05$ . Reference variables are female aged over 60yrs<sup>1</sup>, tertiary and vocational level<sup>2</sup>, no occupation<sup>3</sup>, experienced no side effect<sup>4</sup> and no treatment partner<sup>5</sup>. HW means health worker

## DISCUSSION

Adherence to TB treatment is a long dynamic process affected by interactions among structural, personal, societal and health service factors.<sup>9</sup> This study shows that patient's understanding of their illness and treatment and the facility's directly-observed treatment and health education strategies are significant factors in promoting adherence to treatment. Moreover, this study provides evidence that although DOTS are supposedly being adopted by all facilities studied, the difference in implementation between purely public and PPM facilities seems to result to different treatment outcomes. Although PPM facility has been found to be associated with patient adherence, more studies should be done to evaluate the effectiveness of PPM over purely public facilities and to demonstrate the efficiency of PPM in providing DOTS. Moreover, the findings of this study could be stronger with larger sample size but tracing patients was difficult, particularly for non-adherent respondents. The sample size could be larger if all qualified PPM in Metro Manila participated in the study. The patients were sampled from the TB registry from 2003 to 2005 of study facilities, thus findings may be affected by recall bias.

Findings that personal factors like being female, younger age, employment status and higher income are important factors in adherence to treatment.<sup>10 11</sup> These factors are known to affect patient's motivation and motivated patients are more likely to finish treatment. Moreover, adherent patients are more knowledgeable about tuberculosis than those who are not. The significant effect of understanding the side effects of drugs and DOTS process on adherence is consistent with earlier studies.<sup>12 13</sup> These findings underscore the importance of increasing patient's knowledge about their health and treatment.<sup>14</sup> Patient consultation delay was previously found to be associated with financial difficulty and inaccessibility of DOTS facility<sup>15 16</sup> but delay and external constraints like cost of transportation and distance to DOTS health facility do not significantly affect adherence in this study. This may be due to free anti-TB medicines and the fact that most respondents walked or rode a bicycle to the facility.

Previous studies presented conflicting evidence on effect of DOTS strategy in promoting adherence to treatment. Some studies lauded the importance to adherence of directly observing the patient while they take their medication<sup>17 18</sup> while other studies demonstrated the opposite.<sup>19 20</sup> This study strongly confirms the importance of treatment partner in promoting positive treatment outcome, especially when the treatment partner is a health professional. However, this strategy should be tailored to patient's need as shown by lack of significance of the place of treatment to outcome. Strong association

between having treatment partner and adherence may be due to strengthened patient-provider communication and perceived higher quality of care.

The National Tuberculosis Control Program Manual of Procedures<sup>21</sup> published by DOH identified health education, directly observed treatment, i.e. assigning a treatment partner, and provision of non-monetary incentive to health workers and volunteers as strategies to improve treatment adherence. Except for incentive for health provider which is not tested in this study, the interventions identified by the DOH are found to be strong predictors for adherence. Moreover, incentive for patient significantly affects successful treatment outcome, a finding consistent with earlier studies.<sup>22 23</sup> Patient's health education for TB treatment (measured as patient's understanding of DOTS), directly observed treatment (measured as presence of treatment partner) and incentive for patient are all associated with PPM DOTS (PPMD) facility. PPMD in turn is significantly associated with treatment adherence.

Although all health facilities selected for this study are certified by DOH as DOTS providers, these facilities seem to give varying emphasis in implementing the different components of this strategy. The empirical evidence of this paper suggests that purely public DOTS facilities in Metro Manila could improve TB treatment adherence by strengthening patient education, consistently assigning treatment partner and if possible, providing non-monetary incentive to the patient. PPMD facilities are significantly associated with adherence to treatment. However, there is a need to evaluate their efficiency in providing quality TB care. It may also be worthwhile to compare the strategies and outcomes of purely public DOTS in Metro Manila with other highly urbanized cities in the Philippines.

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**What this paper adds:**

DOTS is the recommended strategy for effective TB control program but adherence to TB treatment remains a problem especially in urban settings. This paper provides empirical evidence on factors that affect adherence among TB patients attending DOTS facilities in Metro Manila, Philippines. It also provides initial evidence that public-private mix DOTS (PPMD) facilities are more effective in delivering DOTS services. However, the efficiency of PPMD may need to be evaluated.

**Policy Implications**

Improving patient's knowledge on their illness, their treatment regimen and possible side effects; and assigning a treatment partner can increase adherence to treatment and contribute to the achievement TB control goals. Focusing on and strengthening these strategies can improve adherence to TB treatment in public DOTS facilities. PPM DOTS facilities in this study may provide lessons in enhancing patient health education and effective treatment partnership.

# **A Study on the Reporting Systems and Occurrence of Adverse Events In PhilHealth-Accredited Tertiary Hospitals in the National Capital Region**



**Quality Assurance Research and Policy Development Group  
Philippine Health Insurance Corporation**

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## **A Study on the Reporting Systems and Occurrence of Adverse Events in PhilHealth-Accredited Tertiary Hospitals in the National Capital Region**

Quality Assurance Research and Policy Development Group  
Philippine Health Insurance Corporation

### **ABSTRACT**

**Background:** Various patient safety practices have been documented to address the different adverse events occurring in the health care system. In the Philippine health care setting however, limited documentation has been done and the only identified existing system is for adverse drug reaction (ADR) monitoring and reporting. Hospitals are assumed to have their own programs and mechanisms to ensure patient safety.

**Objective:** The aim of the present study is to determine the status of patient safety programs and mechanisms particularly the adverse events handling and monitoring systems in PhilHealth-accredited health care facilities in the National Capital Region.

**Methodology:** A cross-sectional study involving randomly selected PhilHealth-accredited tertiary hospitals in the National Capital Region was done from September 2006 to March 2007. All selected hospitals were informed of the initiative and were asked to participate in an informal, semi-structured interview conducted by Quality Assurance Research and Policy Development Group (QARPDG) medical officers and staff. The data collection tool used was composed of a mix of closed- and open-ended questions pertaining to occurrence of adverse events in the hospitals and how these events are presently reported and addressed.

**Results:** A total of 56 randomly selected tertiary hospitals were included in this study. Twenty eight of the hospitals are government owned institutions while the other 28 are privately owned. Majority of the hospitals reported the availability of adverse event reporting systems (93%) and the most common system of reporting adverse events is thru the use of incident report forms. The majority of the hospitals conduct staff trainings on patient safety issues (54/56) with an average number of safety programs reported at 4 (SD±2). Investigation is the primary action common to most hospitals after an adverse event has been reported. The succeeding steps after the reporting may be classified as either "negative" or "positive" measures or reinforcements. Among government hospitals visited, the three most common adverse events cited by the hospital representatives are accidents, nosocomial infections and medications errors. On the other hand, among privately owned institutions, the most common include medication errors, accidents and procedural errors.

**Conclusions:** Adverse events are investigated, discussed in committee meetings and the recommendations commonly made include sanctions and penalties. The five most common adverse events reported in the hospitals in the past year included medication errors, accidents, procedural errors, nosocomial infections and burns involving intravenous fluids/medications.

**Key words:** *patient safety, hospitals, tertiary*

# **A Study on the Reporting Systems and Occurrence of Adverse Events in PhilHealth-Accredited Tertiary Hospitals in the National Capital Region**

Quality Assurance Research and Policy Development Group  
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## ***Background of the Study***

Various patient safety practices have been documented to address the different adverse events occurring in the health care system. International studies and initiatives have been done to identify a set of proven patient safety practices that can be used by hospitals. The movements in patient safety practices represent various efforts to determine what it is that could be done in an effort to improve safety of patients in the hospitals.

In the Philippine health care setting however, limited documentation has been done and the only identified existing system is for adverse drug reaction (ADR) monitoring and reporting. The Bureau of Food and Drugs (BFAD) in the Philippines has developed a National Adverse Drug Reaction Advisory Committee (NADRAC) website in aid of monitoring, reporting, collating and analyzing reports of adverse drug reactions coming from all parts of the Philippines. A local study done in 1999 showed that there was a continuous increase of ADR reporting from 1994 to 1997, then a decrease by 24% in 1998 after which the reporting steadily increased again in 1999 (Wong et al, 1999). This study was the first identified effort to analyze data on adverse drug reactions on an aggregate basis.

Hospitals are assumed to have their own programs and mechanisms to ensure patient safety. However, these methods are varied,

undocumented and doubts of its existence are numerous. There is a need to document, monitor and track the different patient safety mechanisms currently in practice among the health care institutions. By documenting them, pertinent policies or standards affecting patient safety can be enforced, new strategies can be introduced, and improvements can be made on the quality of health care in the country. Thus, it is the aim of the present study to determine the status of patient safety programs and mechanisms particularly the adverse events handling and monitoring systems in PhilHealth-accredited health care facilities in the National Capital Region.

## **Objectives**

### **General Objective**

To describe the existing reporting systems and the occurrences of adverse events among PhilHealth-accredited tertiary hospitals in the National Capital Region

### **Specific Objectives**

To determine availability of different systems of adverse events reporting and the measures on how the hospitals address these adverse events

To describe the different strategies/programs/mechanisms employed by tertiary hospitals in ensuring patient safety

To determine the five most commonly reported adverse events occurring in PhilHealth-accredited tertiary hospitals

To determine quality improvement activities currently in place among PhilHealth-accredited tertiary hospitals



## ***Methodology***

A cross-sectional study involving randomly selected PhilHealth-accredited tertiary hospitals in the National Capital Region was done from September 2006 to March 2007. All selected hospitals were informed of the initiative and were asked to participate in an informal, semi-structured interview conducted by the Quality Assurance Research and Policy Development Group (QARPDG) medical officers and staff. The study respondents to the interview included the hospital administrators, medical directors, chief nurses, quality assurance officers and/or representatives from the hospital's legal department. References made regarding hospitals in this study pertain to the responses of the hospital representatives interviewed.

The data collection tool used was composed of a combination of closed- and open-ended questions pertaining to the occurrence of adverse events in the hospitals and how these events are presently reported and addressed. Possible response items were based on literature reviews on patient safety and adverse events initiatives in both the local and international scene.

The sample size was computed based on the assumption that there was an 85% probability of a tertiary hospital incurring some form of adverse event. The error of estimate was placed at 0.05. A total of 56 hospitals were then randomly selected using random numbers in Microsoft Excel.

Interview sessions were scheduled at the hospitals' convenience and were conducted in an informal setting to alleviate any discomfort both for data enumerators and interviewees. Data were handled with utmost confidentiality. All data collection forms had no identifying marks and were

not disclosed nor made available to anyone outside the team conducting the study.

All quantitative data were encoded using the Statistical Package for the Social Sciences version 10, while qualitative data from the open-ended questions were analyzed using KJ Analysis. Qualitative data are therefore reported in this paper as themes and categories of ideas on patient safety, which are common to all hospitals interviewed and will not show frequency and proportions. All pertinent data were summarized into tables and are available at the QARPDG Office of PhilHealth.

## **Results**

A total of 56 randomly selected tertiary hospitals were included in this study. Twenty eight of the hospitals are government owned institutions while the other 28 are privately owned. Residency training programs are available in 78% (44/56) while fellowship trainings are offered in only 41% of the hospitals.

Overall, accreditation records showed an average of 16 years (SD±4.45) certification by PhilHealth and accreditation was longer among private hospitals compared to government owned institutions (15.75 years and 14.63 years,  $p>0.05$ ). On the other hand, the accredited bed capacity was higher among government hospitals than in private institutions (Table 1,  $p>0.05$ ).

Total manpower compliment had an average of 479 (SD±459), with government hospitals having more manpower than private hospitals ( $p >0.05$ ). There are more full-time nurses employed among government

**Table 1 Overall Characteristics of Selected Tertiary Hospitals in the National Capital Region included in the Patient Safety Survey (Sep 2006 – Mar 2007)**

Overall Characteristics of Hospitals	Total Hospitals (n=56)	NCR Central (n=21)	NCR South (n=14)	NCR North (n=21)
<b>Number of Years Accredited by PhilHealth, Mean (<math>\pm</math> SD)</b>	15.19 ( $\pm$ 4.45)	16.67 ( $\pm$ 4.44)	14.65 ( $\pm$ 5.06)	14.05 ( $\pm$ 5.53)
<b>Authorized Number of Beds, Mean (<math>\pm</math> SD)</b> Minimum / Maximum	355 ( $\pm$ 587) 40/4200	322 ( $\pm$ 587) 65/1200	211 ( $\pm$ 163) 50/600	485 ( $\pm$ 905) 40/4200
<b>Accredited Number of Beds, Mean (<math>\pm</math> SD)</b> Minimum / Maximum	274 ( $\pm$ 254) 40/1334	314 ( $\pm$ 268) 65/1200	218 ( $\pm$ 160) 50/600	271 ( $\pm$ 292) 40/1334
<b>Total Manpower compliment, Mean (<math>\pm</math> SD)</b> Minimum / Maximum	479 ( $\pm$ 459) 42/2410	508 ( $\pm$ 459) 93/1946	427 ( $\pm$ 357) 134/1434	486 ( $\pm$ 553) 42/2410
<b>Hospital Category, %</b>				
Government	50 (28/56)	48 (10/21)	43 (6/14)	57 (12/21)
Private	50 (28/56)	52 (11/21)	57 (8/14)	43 (9/21)
<b>Training Programs, %</b>				
Residency training program	79 (44)	86 (18)	64 (9)	81 (17)
Fellowship training program	41 (23)	57 (12)	29 (4)	33 (7)

hospitals whereas more full time physicians are employed in private institutions (Table 2). However, in terms of ratio of nurses to patients admitted, private hospitals have a better nurse-patient ratio than government institutions (1:7 and 1:16, respectively.) This is attributed to the higher number of authorized and accredited bed capacities in government hospitals compared to the privately owned institutions (Table 1). Higher number of beds and nurses for government hospitals mean larger number of patients admitted compared to private institutions where a smaller number of patients are admitted due to a lesser bed capacity.

Residency training program was not offered in 18% (5/28) of the government hospitals and in 25% (7/28) of the privately owned institutions. Availability of training programs in the hospitals might be considered an advantage if patient safety has been incorporated into the curriculum of the programs, which unfortunately is beyond the scope of this paper.

Implementation of quality assurance activities such as clinical practice guidelines, medical audits and mortality-morbidity meetings was more common in government institutions while QA activities like complaints analysis, credentialing and clinical privileging and expanded incident monitoring were more frequent in private hospitals (Table 3). Likewise, clinical decision support systems such as computerized physician order sheet and pharmacy computer systems are generally found among the private hospitals (Table 4).