USAID
FROM THE AMERICAN PEOPLE

USAID
ASSIST PROJECT
Applying Science to Strengthen and Improve Systems

TECHNICAL REPORT

Indonesia Hospital Accreditation Process Impact Evaluation: Midline Report

SEPTEMBER 2015

This report was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID) and authored by Edward Broughton of URC and Anhari Achadi, Kamaluddin Latief, Fitri Nandiaty, Nurhaidah, Siti Nurul Qomariyah, Tika Rianty, Sri Wahyuni, and Arum Eskaning of the Center for Family Welfare/ Universitas Indonesia under the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project. The work of the USAID ASSIST Project is made possible by the generous support of the American people through USAID.

TECHNICAL REPORT

Indonesia hospital accreditation process impact evaluation: Midline report

SEPTEMBER 2015

Edward Broughton, University Research Co., LLC
Anhari Achadi, Center for Family Welfare / Universitas Indonesia
Kamaluddin Latief, M. Epic, Center for Family Welfare / Universitas Indonesia
Fitri Nandiaty, Center for Family Welfare / Universitas Indonesia
Nurhaidah, Center for Family Welfare / Universitas Indonesia
Siti Nurul Qomariyah, Center for Family Welfare / Universitas Indonesia
Tika Rianty, Center for Family Welfare / Universitas Indonesia
Sri Wahyuni, Center for Family Welfare / Universitas Indonesia
Arum Eskaning, Center for Family Welfare / Universitas Indonesia

Acknowledgements

This report was prepared by University Research Co., LLC (URC) under the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project, which is funded by the American people through USAID's Bureau for Global Health, Office of Health Systems. The project is managed by URC under the terms of Cooperative Agreement Number AID-OAA-A-12-00101. URC's global partners for USAID ASSIST include: EnCompass LLC; FHI 360; Harvard University School of Public Health; HEALTHQUAL International; Initiatives Inc.; Institute for Healthcare Improvement; Johns Hopkins Center for Communication Programs; and WI-HER LLC.

For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

Recommended citation

Broughton E, Achadi A, Latief K, Nandiaty F, Nurhaidah, Qomariyah SN, Rianty T, Wahyuni S, Eskaning AP. 2015. Indonesia hospital accreditation process impact evaluation: Midline report. *Technical Report*. Published by the USAID ASSIST Project. Bethesda, MD: University Research Co., LLC (URC).

TABLE OF CONTENTS

Glossary

Accreditation Team	The committee in a hospital responsible for administration of all activities related to organizational health care accreditation or certification.
Adverse Event	An unanticipated, undesirable, or potentially dangerous occurrence in a health care organization.
Bed Occupancy Rate (BOR)	The percentage of available beds which have been occupied over a given period. It is calculated by dividing the number of occupied bed days for the period, by the number of available bed days for the period, and expressing the result as a percentage. It is a measure of the intensity of hospital resources utilized by in-patients.
Bed Turn Over (BTO)	The mean number of patients who use a given bed during a specific period. It indicates the use made of available beds.
BPJS (Social Insurance Board)	BPJS is a public agency established to implement the social security program, directly under President (not ministry). It consists of the BPJS for Health and the BPJS for Manpower.
Center of Excellence (Leading service in hospital)	Identified as the most expert clinical service in a hospital, which is most favored among the other clinical services they have. Usually, to be the main focus developed by a hospital and to be the referral center for clinical services in that specialty.
Clinical Guidelines (Medical Service Standards)	A systematically developed statements to assist clinicians and patients in deciding about appropriate health care for specific clinical circumstances
Clinical Staff	Those who provide direct patient care (physicians, dentists, nurses, therapists, etc.)
Discharge Summary	A section of a patient record that summarizes the reasons for admittance, significant findings, the procedures performed, the treatment rendered, the patient's condition on discharge, and any specific instructions given to the patient or family (for example, follow-up medications).
Government/Social Insurance	***Jamsostek***: Social insurance for private sector workers | health insurance for formal workers and social insurance for workers in large factories. The social insurance fund for private sector employers and their employees that usually covers workers in large factories. It provides four programs: employment injury, death, health insurance, and a provident fund type old age benefit. ***Askes***: Health insurance for civil servants and retired armed forces personnel. Active and retired civil servants, retired military and police personnel, veterans and national patriots, and their dependents are covered by this compulsory health insurance scheme managed by PT Askes
Health Care–associated Infection (HAI)	Any infection(s) acquired by an individual while receiving care or services in a health care organization. Common HAIs are urinary infections, surgical wound infections, pneumonia, and bloodstream infections.
High-risk or High-alert Medication	Those drugs that carry a risk for errors that can lead to significant adverse outcomes.
Hospital Formulary	List of pharmaceutical products that are approved for use in the hospital and are often held in the stock at the hospital pharmacy.
INA CBGs Tariff	Indonesia Cost Based Group tariff
Informed Consent	Agreement or permission accompanied by full information on the nature, risks, and alternatives of a medical procedure or treatment before the physician or other health care professional begins the procedure or treatment. After receiving this information, the patient either consents to or refuses such a procedure or treatment.
Inpatient	Generally, persons who are admitted to and housed in a health care organization at least overnight.

Jamkesda (Regional Health Insurance for the Poor and Near Poor)	Social health insurance provided by provincial or district governments. Jamkesda typically targets people identified by the local authorities as poor but not covered by Jamkesmas (because of mis-targeting or because they recently became poor due to illness, etc), with some provinces (such as Bali and Aceh) heading toward universal health insurance. Schemes vary between provinces/districts and benefits are normally only provided through health care providers in their respective provinces
Jamkesmas (National Health Insurance for the Poor and Near Poor)	A national tax-funded health insurance plan that targets the poor and near poor through a proxy means test targeting method. The scheme provides beneficiaries with free health services in Community Health Centers (Puskesmas) and 3rd class (basic level) wards in government hospitals and designated private hospitals.
Jampersal (Universal Delivery Care)	Universal health care for pregnant women or those who have just delivered provided free of charge to the woman and , including pre-natal and post-natal consultations. Consultation and delivery care are provided in health facilities which have MOU (Memorandum of Understanding)with the local government, including midwifery clinics, health centers or third class wards in hospitals.
JKN	National Health Insurance (NHI), NHI program conducted by the Social Security Providers (BPJS) as mandated by Law number 40 of 2004 on National Social Security System (SJSN) and the Law number 24 of 2011 on BPJS.
KARS Accreditation Achievement	***Basic Achievement***: Four chapters are classified Major, the minimum value of each chapter have to 80% (hospital patient safety goals, PFR, PFE, QPS). Eleven chapters are classified Minor, the minimum value of each chapter have to 20% (MDG's,ACC,AOP,COP, ASC,MMU,MOI,SQE, PCI, GLD,FMS) ***Madya Achievement***: Eight chapters are classified Major, the minimum value of each chapter have to 80% (hospital patient safety goals, PFR,PFE,QPS, MDG's,ACC,AOP,COP). Seven chapters are classified Minor, the minimum value of each chapter have to 20% (ASC,MMO,MOI,SQE,PCI,GLD,FMS) ***Utama Achievement***: Twelve chapters are classified Major, the minimum value of each chapter have to 80% (hospital patient safety goals, PFR, PFE, QPS, MDG's, ACC, AOP, COP, ASC, MMO, MOI, SQE). Three chapters are classified Minor, the minimum value of each chapter have to 20% (PCI, GLD, FMS). ***Paripurna Achievement***: Fiftteen chapters (all) are classified Major, the minimum value of each chapter have to 80% (hospital patient safety goals, PFR, PFE, QPS, MDG's, ACC, AOP, COP, ASC, MMO, MOI, SQE, PCI, GLD, FMS).
Length of Stay (LOS)	The period of time a patient remains in a hospital or other health care facility as an inpatient
Medical Committee	A committee responsible for defining clinical governance within the hospital to ensure the professionalism of all medical staff mandating they all have the appropriate credentials, practice to a high level of quality in there, medical professional conduct, and maintain the medical profession ethical and discipline.
Medical Equipment	Fixed and portable equipment used for the diagnosis, treatment, monitoring, and direct care of individuals.
Medical Service Division	A division within Medical Service Unit whose main task is to optimally promote well-being and recovery of patients through accountable procedures and treatments.
Medical Staff	All physicians, dentists, and other professionals who are licensed to practice independently (without supervision) and who provide preventive, curative, restorative, surgical, rehabilitative, or other medical or dental services to patients; or who provide interpretative services for patients, such as pathology, radiology, or laboratory services, regardless of the organization's classification of appointment, employment status, contract, or otherarrangements with the individual to provide suchpatient care services.

Near Miss	Any process variation that did not affect an outcome but for which a recurrence carries a significant chance of a serious adverse outcome. Such a “near miss” falls within the scope of the definition of an adverse event. *Also see* adverse event.
Net Death Rate (NDR)	Also known as the institutional death rate, it is the proportion of patients admitted to a hospital who died 48 hours or more after admission
Nonclinical Staff	Those who provide indirect patient care (admissions, food service, among others).
Nosocomial Infection	An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission (infections that show clinical signs within 48 hours are therefore not usually included). This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility. *See also: Health care-associated infection.*
Outpatient	Generally, a patient who does not stay overnight in the hospital.
Patient-centered:	Standards that are organized according to what is done directly or indirectly for or to patients (for example, patient education, creation of patient records, patient assessment).
Patient Record/ Medical Record/ Clinical Record	A written account of a variety of patient health information, such as assessment findings, treatment details, progress notes, and discharge summary. This record is created by health care professionals.
Pharmacy and Therapy Committee	An advisory group that considers essentially all matters related to the use of drugs in a hospital including evaluation of drugs & dosage forms and safe use of investigational drugs. It is responsible for framing policies and procedures for selection, procurement, dispensing, labeling, availability, administration, and control of drugs throughout the hospital. This committee is composed of physicians, pharmacists and other health care professionals selected with the guidance of the medical staff.
Pharmacy Unit	A unit whose main responsibility is to provide quality medicine, including clinical pharmacy services affordable to all segment of the community. The unit also in charge of all pharmacy supplies circulated within the hospital.
Protocol	Scientific treatment plan including schedule, procedures, medications and dosages, among others.
Quality Improvement	An approach to the continuous study and improvement of the processes of providing health care services to meet the needs of patients and others. Synonyms include: *continuous quality improvement*, *continuous improvement*, *organization-wide performance improvement*, and *total quality management*.
Quality of Care	The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. Dimensions of performance include the following: patient perspective issues; safety of the care environment; and accessibility, appropriateness, continuity, effectiveness, efficacy, efficiency, and timeliness of care.
Referral	The sending of an individual (1) from one clinician to another clinician or specialist or (2) from one setting or service to another or other resource, either for consultation or care
Safety	The degree that the organization’s buildings, grounds, and equipment do not pose a hazard or risk to patients, staff, or visitors.
Side Effect	Pharmacological effect of a drug, normally adverse, other than the one(s) for which the drug is prescribed.
SKTM Card (Surat Keterangan Tidak Mampu)	An official document from the village head explaining that the person described in the document is poor, and not able to pay the hospital charges.

Teaching Hospital	Hospitals accredited by Teaching Hospital Accreditation Team. The Teaching Hospital Accreditation Team is under Ministry of Health and led by Director of Specialist Medical Services Directorate. ***Main Teaching Hospital***: A hospital classified as Class A or B with a minimum of accredited 12 services (2007 version) that is used as a vehicle of learning sites.It must meet all or most part of the education modules based on Education Standards of Medical Profession ***Affiliate Teaching Hospital***: Specialized or General Hospital classified as Class A or B with a certain leading service (center of excellence) that becomes part of Medical Education Institution and a referral center for particular medical service. It is used as a vehicle for clinical learning to meet specific education module comprehensively, in order to achieve the competencies based on the Education Standards of Medical Profession. ***Satelite Teaching Hospital***: Hospitals part of the Medical Educational Institution or Main Teaching Hospital networking, has been accredited under KARS for a minimum five services, and is used as a vehicle for clinical learning to meet part of education modules in order to achieve the competencies based on the Education Standards of Medical Profession.
Turn Over Interval (TOI)	Average period in days that an available bed remains empty between the discharge of one inpatient and the admission of the next. It indicates the time that available beds are free. It indicates a shortage of beds when negative, and under-use of the hospital or an inefficient admission system if positive.
Type of Hospital	***Class A Hospital***: Consists of minimum 4 basic specialist services (internal, pediatric, obstetric, and surgery), 5 supporting medical specialist services (anesthesia, radiology, medicalrehabilitation, anatomic pathology, clinical pathology), 12 other specialist services, and 13 sub-specialists. Basic medical services have at least 18 doctors and 4 dentists on staff. Minimum 400 beds. ***Class B Hospital***: Consist of minimum4 basic specialist services (internal, pediatric, obstetric, and surgery), 4 supporting medic specialist services (anesthesia, radiology, rehabilitation medic, anatomic pathology), 8 other specialist services and 2 sub-specialist services. Basic medical services have at least 12 doctors and 3 dentists on staff. Minimum 200 beds. ***Class C Hospital***: Consists of minimum 4 basic specialist services (internal, pediatric, obstetric, and surgery), 4 supporting medical specialist services (anesthesia, radiology, rehabilitation medicine, anatomic pathology). Basic medical services have at least 9 doctors and 2 dentists on staff. Minimum 100 beds. ***Class D Hospital***: Consists of minimum 2 basic specialist services among 4 specialist services (internal, pediatric, obstetrics, and surgery). Basic medical services have at least 4 doctors and 1 dentist on staff. Minimum 50 beds.

Acronyms

AMI	Acute Myocardial Infarction
ASSIST	USAID Applying Science to Strengthen and Improve Systems Project
BPHS	Basic Package of Health Services
BPJS	*Badan Penyelenggara Jaminan Sosial* (Social Insurance Board, Administrator of the National Health Insurance Program)
CBG	Cost-based Group
GoI	Government of Indonesia
HAPIE	Hospital Accreditation Process Impact Evaluation
HCI	USAID Health Care Improvement Project
ICCU	Intensive Cardiac Care Unit
ICD	International Classification of Diseases

ISO	International Organization for Standardization
JCI	Joint Commission International
JKN	*Jaminan Kesehatan Nasional* (National Health Insurance Program)
IRMIK	Medical Record Unit
KARS	*Komisi Akreditasi Rumah Sakit* (Commission for the Accreditation of Hospitals)
MoH	Ministry of Health
NHA	No Hospital Accreditation
NHI	National Health Insurance
OA	Organizational Audit
OHSAS	Occupational Health and Safety Advisory Services
ORIF	Open Reduction and Internal Fixation
PPK	*Panduan Praktek Klinik* (Clinical Practice Guideline)
SJSN	National Social Security System
SPM	*Standar Pelayanan Medik* (Medical Services Standard)
USAID	United States Agency for International Development
WHO	World Health Organization

Index of Tables

Index of Figures

EXECUTIVE SUMMARY

Introduction

In 2011, USAID Indonesia commissioned the USAID Health Care Improvement Project (HCI) to conduct a study of hospital accreditation. After the baseline assessment, support for the activity was provided through the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project.

The overall objective of the Hospital Accreditation Process Impact Evaluation (HAPIE) longitudinal study is to examine changes in quality and safety performance of nine hospitals undergoing accreditation with: 1) Joint Commission International (JCI); 2) *Komisi Akreditasi Rumah Sakit* (KARS – the Indonesian accreditation system) before 2016; and 3) KARS after 2016 but no hospital accreditation (NHA) during the study.

The study is being conducted in three phases: baseline (completed August 2013), mid-line (current report) and end line (data collection planned for January 2016). This report examines the midline data in relation to the baseline. The questions addressed in this study are:

- Are there changes in the quality of services and patient outcomes and experiences in the hospitals associated with the accreditation process they are undergoing?
- Are there differences in the changes in service quality and related patient outcomes and experiences among the nine hospitals associated with the type of accreditation they are undergoing?
- What is the general experience with the accreditation process in the period since the baseline assessment?

Primary qualitative and quantitative as well as some secondary data collected by the hospitals was used to determine changes in quality performance in the hospitals.

Changes to Indonesia's Health System

One major confounder in the HAPIE study is the implementation of the new JKN (Jaminan Kesehatan Nasional) national health insurance program which began January 2014. JKN is a guarantee of health health insurance coverage for all people living in Indonesia as mandated by the Constitution (UUD) 1945 Section 28 H on the right of every person to obtain health care. When fully implemented as planned for 2019, it will be the largest single-payer health insurance system in the world, covering approximately 250 million people.

Implementation has impacted the nine hospitals profoundly but differently. While it was not part of this study to specifically evaluate the consequences JKN on the quality performance of hospitals, is has become an important part of the study. It is difficult to distinguish between the effects of the JKN system and those associated with the different accreditation process and it is possible that the two are related.

Study Design

Quantitative methods were applied to determine hospital service quality and performance and included clinical charts review for one of four conditions (normal vaginal delivery, pediatric pneumonia, acute myocardial infarction and hip fracture) and interviews from inpatients in four wards (obstetric, pediatric, internal medicine and surgery). We also collected data from observations and reviews of hospital documents, regulations, and policies along with interviews with key informants from all hospitals.

The hospital review captured data in ten domains: Hospital Governance; Patient Orientation; Human Resources; Clinical Practice & Patient Care; Health Care-Associated Infections; Transfusion; Hospital Facilities Management; Medication Safety; Documentation and Records; and Surgery, Interventional Procedures and Anesthesia.

An organizational audit was conducted to describe the quality of care at the unit/department level within a hospital related to the four diagnoses listed above. A questionnaire captured patients' experiences with their care during their inpatient stay. A total of 55 key informants, most from hospital

accreditation teams, were interviewed. There were two from each hospital except for the four from one hospital.

The midline phase of the study was approved by the Institutional Review Boards of Universitas Indonesia and conducted with support from the Indonesian Ministry of Health (MoH). Hospital administrators gave permission for data collection to occur in their hospitals. All patients and informants interviewed were asked for their informed consent and precautions were taken to ensure their anonymity.

Data Collection and Analysis

Organizational audit: This describes the quality of care at the unit/department level for the four diagnoses of interest, i.e., in-patient ward, delivery ward, perinatal ward and Intensive Cardiac Care Unit (ICCU).

Clinical review: Patient medical records were reviewed from a sample taken at random for the diagnoses normal vaginal delivery, childhood pneumonia, hip and femur factures and acute myocardial infarction. The charts were reviewed for elements such as patient characteristics, completeness of clinical information and patient outcomes.

***Patient questionnaire*:** This tool captured patients' experiences with care they received during their inpatient stay.

***Hospital-based data*:** Secondary data were collected from each hospital where possible on service quality, hospital company profile, hospital performance indicators, policies on regulations in all aspects, adverse events, and the formulation of committees to address deficiencies in patient care or hospital operations and, when available, the costs related to accreditation preparation.

***Stakeholder interviews*:** Interviews with Chiefs of Medical Services, Hospital Accreditation Team members, Finance Manager, Unit of hospital information system, and the Health Insurance Unit aimed to understand their opinions on the purpose of hospital accreditation, how the accreditation program was progressing from the perspectives of senior officials at participating hospitals, KARS, and the MoH, and how the accreditation process influences the quality of care available delivered at the hospital in the future as well as changes in hospital policy regarding JKN.

For the hospital review and organizational audit, the research team discussed the results obtained to ensure standardization of scoring. Hospital review data were scored against standardized criteria using a 0-4 rating (0 is non-compliant, 4 is fully compliant). Organizational audit data were scored 0, 2 and 4. Data from clinical chart reviews and from patient experience questionnaires were analyzed by individual hospitals. Stakeholder interviews were recorded, transcribed and analyzed. Descriptive analysis was done to all variables. Chi-square statistical tests were used to examine associations between variables.

Categorizing studied hospitals: From baseline to midline, the accreditation status and plans of some hospitals changed. One hospital designated for JCI opted out while another decided to progress toward JCI accreditation without a mandate from the MoH. One JCI hospital delayed their seeking JCI for a year. The midline categorization of hospitals reflects these changes.

Results

Hospital Review

- **Hospital governance**: Performance on this domain was generally mixed.
- **Patient orientation:** JCI hospitals showed an increases as did Hospitals C and G (KARS). Only Hospital H among NHA hospitals showed an increase. Average scores for all hospitals increased from 2.8 to 3.0.
- **Human resources:** Hospital B (JCI) showed a decrease while KARS hospitals showed an increase or were unchanged. Among NHA hospitals, only hospital I showed an increased. Average score for all was 2.9 at baseline and increased to 3.1.
- **Clinical practice and patient care**: All JCI hospitals and all KARS hospitals except Hospital C also increased. All hospitals NHA decreased, mostly due to a lack of resuscitation

equipment and diagrammatic instructions and guidelines on antibiotics use.

- **Health care associated infections:** The average scores for all nine hospitals increased by 0.2 with only Hospitals F and G (KARS) showing a decrease. NHA hospitals were generally lower.
- **Transfusion:** Two of three JCI hospitals decreased while two KARS hospitals improved and two remained unchanged. There was no change in the NHA hospitals.
- **Facilities Management:** There was minimal change in the overall average in this domain. All JCI hospitals showed a slight increase.
- **Medication Safety:** Scores for medication safety ranged from a mean of 2.5 at baseline to a mean of 3.2 in the midline. Only Hospital H (NHA) did not shown an increase over the period and they started from a lower baseline.
- **Surgery, Procedures and Anesthesia:** The mean difference from baseline to midline was an increase of 0.2 to 3.0 overall. Only Hospitals A (JCI) and H and I (NHA) did not shown an improvement. NHA hospitals started from a generally lower baseline.
- **Documentation and Records:** Two of three JCI hospitals increased, while three KARS hospitals decreased, and all NHA hospitals decreased.

Organizational Audit

The Organizational Audit (OA) was based on 10 criteria determined from the four hospital departments, obstetric, pediatric, internal medicine and surgery. Composite results showed that the majority of hospitals improved from baseline to midline. There were major improvement in Hospitals A, E and G, while Hospital F experienced a slight decrease. Maternity departments had high compliance with quality standards than units treating hip and femur fractures.

Clinical Chart Review

There were significant changes in payment methods noted in clinical charts and there was generally an improvement in the degree of completeness of the records but major deficiencies remain. There was no major differences between the hospital groups. The length of stay in most hospital categories at each department decreased in the midline, especially in JCI hospitals. In KARS hospitals in pediatric departments, there was a slightly increase from baseline to midline (from 5 to 6 days).

Patient Questionnaires

In Hospitals C and D there was an improved inpatient perception of medical services but in all seven others there was a decreased. There was a decrease from baseline to midline in all categories with KARS hospitals experiencing the greatest decline. The perception of nurses also decreased with the again KARS hospitals experiencing the greatest gains. For perceptions of medical decision-making and discharge instruction category, JCI hospitals showed an improvement while KARS hospitals had a slight decrease and NHA hospitals had a greater decrease.

In all hospitals, the perception of patient of hospital facilities decreased around 2% between baseline and midline. By hospital category, JCI hospitals were essentially unchanged while the other two hospital categories decreased by about the same proportion.

Key Informant Interviews

The informants included hospital management at all levels, accreditation team members and various committee members in the nine study hospitals. We grouped the information into three categories: 1) hospital review; 2) accreditation process; and 3) national health insurance implementation.

Hospital Review

Five of nine hospitals performed poorly for reasons such as medical record sheet absences, incomplete clinical information in the medical records, incorrect or missing coding, missing or incomplete discharge summaries and deficiencies in case note storage. Informants from four hospitals admitted they still had deficiencies in medical records standards. This has caused major disruptions in hospital management, especially with implementation of JKN, given its requirements for accurate medical records for payment of claims.

In general the JCI hospitals group performed better than the other two groups. Five of ten domains improved, including patient orientation, clinical practice and patient care, health care-associated infection, facilities management; and medication safety. Factors that appeared associated with this included strong management and leadership, a visibly better work culture, effective communication between management and clinicians, funding and logistics support, and human resources. These criteria are closely associated with patient-centered standards and organization management in the JCI survey instrument. It is not possible from this study to determine whether the improvement is due to the fact that they were seeking JCI accreditation or because they are hospitals with the strongest quality systems even before seeking accreditation. These hospitals generally start from a higher base for most indicators of quality performance used in this study. The hospitals appeared to take JCI accreditation seriously, assigning significant human and material resources to the process.

Facilities

In the midline period, we observed that some hospital facilities did not meet standards for patient safety, especially Hospitals H and I. For example fire extinguishers were absent or outdated, some evacuation routes were inadequate or locked and facilities for the disable were deficient. Almost all study hospitals did not meet safety standards because they were built long ago and had not been renovated as standards evolved. However, some hospitals had made specific changes since the baseline. For example, Hospital E provided standard ward beds, installed central gas facilities and made supply and evacuation route signs. Other hospitals renovated emergency rooms and constructed a new building for Class 3 patients. Three hospitals were renovating their facilities following the Standard of Facility Management System from JCI primarily related to patient safety. Facility renovation and management depend on commitment of hospital management to achieve better quality of care and services.

Clinical Practice

The midline survey showed that all participating hospitals had clinical practice guideline (*Panduan Praktek Klinik* or PPK), but some were incomplete and some Informants stated that they were not yet known and referenced by all hospital clinicians – some did reference them for treatment but others consider them as documents used as a prerequisite for achieving accreditation rather than guidelines for clinical use. There appeared to be no change in the way PPK was implemented in the midline compared to the baseline. Observations and responses in the midline showed that all study hospitals increased their attention to medication safety standard, and all but one hospital, H, showed improvements. In seven of nine hospitals, annual evaluation has been done to examine the appropriateness of the prescription using formulary as the standard.

Patients' Rights

Midline observations showed that all study hospitals had increased attention to patient's rights compared to the baseline, but deficiencies were still noted. Seven of nine hospitals had patient rights information in locations readily seen by patients and families but facilities generally did not appear well designed to maintain privacy for patients and families. In five of nine hospitals patient beds in the third class ward were not provided with curtains between beds. Informants from three hospitals expressed increased concern on patient's right after a highly publicized court trial of a hospital medical doctor. They expressed concern that patients will be more critical of hospital services if they understood their rights. Results from the patient survey showed that not all nine study hospitals explained to patients about their rights and obligations.

Hospital Information System

Examination of hospital documents generally revealed poor data quality and variability between hospitals, making it very difficult to compare their data with the national indicators (Medical Services Standard or *Standar Pelayanan Medik*, SPM). The MoH conducted several trainings on hospital indicators, performed annual evaluations, and provided special rewards (certificate) to hospitals showing high-functioning information system. No hospitals had in place a system to validate their own data. The number of deaths, net death rate and rates of hospital-acquired infection all were not recorded completed in all of the hospitals. Such a fundamental deficiency in tracking important

performance data across all three hospital groups represents a departure from international standards. Considering the importance of hospital performance data to determine the quality of services, there is a need for improvement in data management systems and this may require substantial investment.

All study hospitals enter and process medical records information manually, except billing systems. Five hospitals collect census data from the wards every day, submitted those data to the Medical Record unit (IRMIK) who will process data into standardized reports.

Patient Experience

All hospitals except C and D decreased from baseline to midline period on patient perceptions of their doctors' performance. This could have been because the increasing patient-to-physician ratio and the medical education curriculum or implementation of JKN which has increased demand for hospital services without increasing capacity for medical services of the same quality. Further investigation is needed to determine this relationship. Almost all hospitals decreased in perceptions of nursing services also. The decline may be due to the shortage of nurses, which the MoH has tried to improve using accreditation of medical education institutions and implementing competency tests.

Satisfaction in JCI hospitals increased while in the two other hospital groups it decreased. One reason for the decrease could be implementation of JKN. The first groups to be covered by JKN were active and retired civil servants and military, and Jamkesmas and Jamkesda recipients (both for the poor and near-poor). As stated by some informants, this means that military and civil servants are now essentially receiving the same services as the poor and near-poor, a situation that those of the former group, at a higher social-economic level, may see as objectionable.

Accreditation

Observation showed that success of hospitals achieving accreditation depends on workers' culture and attitudes towards work, leadership, and the readiness of designated teams in the hospitals to implement changes necessary to achieve accreditation. Among the nine study hospitals in this midline survey, five (A, B, D, F and H) hospitals essentially did not experience change since the baseline survey, while three hospitals (B, D, and E) showed a significant improvement in many aspects of their operations. The improved hospitals all had active accreditation teams eagerly pursuing implementation of actions towards accreditation while top management was giving the needed support and authority. In the other six hospitals this was either not as strong or lacking completely.

Informants in hospitals successfully accredited by JCI and KARS emphasized the role of top management in this process. Commitment from top management and financial commitment are needed to drive the process of change. Successful hospitals used their budget on in-house and visits to other successfully accredited hospitals in Indonesia.

KARS (2012) Version

The GoI revised the hospital accreditation instrument based almost entirely on the JCI instrument and have called it the KARS (2012) version. In this midline study, hospitals A, B, and D experienced both JCI and KARS accreditation and informants from these hospitals noted differences between KARS and JCI surveyors, both methods and results. The inconsistency of KARS surveyors was a major concern mentioned by informants from all hospitals.

Informants in five hospitals (A, B, D, E and G) noted that the accreditation process changed the attitudes of hospital personnel, especially those whose job were directly related to patient services.

National Health Insurance (JKN) Implementation

JKN was implemented by the *Badan Penyelenggara Jaminan Sosial* (BPJS, Social Insurance Board and administrator of the National Health Insurance Program) on January 1, 2014 seven months before this midline data collection. According to Indonesian legislation, JKN is compulsory for all Indonesians. The poor and near-poor have their premiums paid by government so they are eligible for health services provided at all government and participating private hospitals. Interviews with hospital

managers reveal that most believe JKN is an excellent program, and they strongly supported its policies.

Implementation of JKN appears to have had different effects on the nine hospitals. One is the change in caseloads and case-mixes in certain parts of the hospital. Several examples lost 20 to 50% of normal delivery cases because they were seen at lower level facilities.

The number of patients with government insurance increased sharply with JKN implementation. At baseline, the proportion of Jamkesmas (pre-JKN government supported insurance for the poor and near-poor) patients was around 30%, but at midline, the proportion of JKN patients was over 50%. In some hospitals the proportion up to 80-90% of the total patients. At baseline, the highest proportion of patients paid out of pocket, and the proportion with government insurance was below 50%.

Another impact of JKN is the average length of stay in the hospital as seen in the clinical chart review for AMI patient that decreased by an average of 2 days overall. It is influenced by the degree of cases handled and service system in the hospital. The use of clinical pathways in patients will be very helpful in providing care and treatment to patients, and this is more apparent in the era of JKN. Here service charge is based on INA-CBG's package and length of stay will influence the cost of hospital services.

JKN has had a major impact on hospital finances, especially on liquidity, so far. Out-of-pocket payments are received directly and immediately by hospitals, while government insurance payments go through claim processes that can take a long time and involve several administrative steps. Hospitals are paid based on diagnostic groups. Some hospitals had experience of short-term liquidity problems but were generally more stable in the long-term.

At midline, four hospitals (B, C, F and I) experienced problems with claims to BPJS which disturbed their cash flow while other hospitals had no adverse impact. Funding for operational costs in the former hospitals was still safe because they had healthy beginning balance. Hospital I for example, had not received any payment claim from BPJS for 3 months. As a result, incentive payments for medical staff were delayed. Of greater impact was when some suppliers stopped providing medicine or goods because the hospital failed to pay balances for several months. Hospitals C and D has similar experience. At the beginning of the JKN transition, liquidity was very disturbed. The numbers of claims that JKN agreed to pay were too small and problems with other claims need to be fixed. Some problems were caused by incomplete medical record, a lack of understanding of JKN concepts, software that had changed several times, and the productivity of verifier from BPJS.

One study hospital submitted medical records to BPJS at end of January 2014, but 70% were rejected by BPJS, and after two correction processes BPJS agreed to pay 50% of the amount claimed. To revise the returned files requires great effort by the hospital, involving finance managers, medical record staff and sometimes medical specialist who provided services.

Conclusion

JCI hospitals started at a higher base of performance on most of the indicators of quality of processes and outcomes of care and generally increased slightly more than the other hospitals though this did not follow for all of the variables measured. Qualitatively, hospitals undergoing JCI accreditation took the process more seriously and invested more time and other resources changing hospital systems than those undergoing just KARS or no accreditation.

Even with the adoption of new standards by KARS in 2012 and other changes in the organization, it still appears that hospitals note problems with the KARS accreditation system that should be addressed. It also appears that the need for KARS (2012) accreditation has not been a stimulus for hospitals to allocate resources and develop systems to address issues in their facilities that may present problems during the accreditation process. We see little evidence that KARS is fostering an improvement in the quality of services in the participating studies.

Implementation of JKN has changed hospital operations, case mix and the attitudes and behavior of patients. Therefore it has been a significant confounder in the HAPIE study, and one taken into consideration.

I. INTRODUCTION

A. Recent History of Accreditation in Indonesia

To improve the quality of hospital services, the Government of the Republic of Indonesia (GOI) requires hospitals to undergo periodic accreditation. To that end, in 1996, a hospital accreditation body known as KARS (*Komisi Akreditasi Rumah Sakit* or Commission for the Accreditation of Hospitals) was established by the Indonesian Ministry of Health [1]. Although all hospitals are required to obtain accreditation through the KARS system, as of 2011 only 720 of the approximately 2300 hospitals (42%) in the country had achieved such accreditation [2].

The KARS system offers three levels accreditation: 5-services, 12 services or 16-services, which hospitals could apply for depending on the number of health services they provide and how they rate their performance on them. In 2012, KARS updated its accreditation standards to be in line with the standards used by the international hospital accreditation agency, Joint Commission International (JCI). By the end of 2014, there were 64 hospitals accredited based on 2012-KARS version. However, 11 hospitals received provisional accreditation, meaning they had deficiencies that need to be rectified before full accreditation can be conferred. Four are government hospitals and seven private. Of those fully accredited, 11 are Class A, 35 are Class B, 12 are Class C and 2 are Class D [3]. Twelve are government hospitals, and 52 are private, and collectively they are less than 2% of the 2,322 hospitals throughout Indonesia [4]. Three government hospitals that were KARS-accredited are hospitals this study, while one hospital is in the process of accreditation inspection at writing.

There were 1,277 hospitals accredited based on 2007 version of the KARS standards with 73% accredited for 5-services; 11% for 12-services; and 16% for 16-hospital-services. However, all accreditation certificates for the 2007-KARS Standards version will expire in June 2015 or before.

The accreditation system was reported to have failed in its objective of improving hospital care for several reasons: 1) there was a lack of independence of KARS from the MoH, the owners of the public hospitals, which created a conflict of interest, 2) the standards focused on input indicators rather than on patient safety, process or quality performance indicators and 3) accreditation was not linked to licensure of the hospitals so there was no significant consequences to not seeking or passing accreditation.

In 2011, the United States Agency for International Development (USAID) agreed to support the GoI to improve health care quality in Indonesian Hospitals. It supported seven hospitals seeking international accreditation through JCI and funded technical assistance for restructuring and upgrading the KARS system to have the process approved by the ISQua “International Accreditation Program” (accrediting the accreditors).

The seven state-owned A-class hospitals that received support from USAID for JCI accreditation include:

- Cipto Mangunkusumo Hospital (Jakarta)
- Sanglah Hospital (Denpasar, Bali)
- Dr. Sardjito Hospital (Yogyakarta)
- Fatmawati Hospital (Jakarta)
- H. Adam Malik Hospital (Medan, North Sumatra)
- Dr. Wahidin Sudirohusodo Hospital (Makassar, South Sulawesi)
- Central Army Gatot Subroto Hospital (Jakarta)
- Hasan Sadikin Hospital (Bandung)

Cipto Mangunkusumo Hospital in Jakarta underwent JCI accreditation survey in December 2012. They initially received a provision pass before a second survey resulted in full accreditation. Sanglah Hospital in Denpasar also underwent JCI survey fully in December 2012 with similar results. Fatmawati Hospital in Jakarta underwent the JCI survey in December 2013 with full accreditation granted on the first attempt. Hasan Sadikin Hospital in Bandung underwent a mock survey with JCI in January 2013, and is planning to undergo final survey in 2015. A large number of deficiencies were

discovered by the surveyors and feedback was given to the hospital to help them prepare for the final survey. They developed quality improvement teams to address deficiencies identified in the mock survey. Sardjito Hospital in Yogyakarta underwent the full JCI surveying October 2014 and received a provisional pass. Dr. Kariadi Hospital in Semarang underwent their mock survey in May 2014 and is planning for the full survey in 2015. M. Hoesin Hospital in Palembang was planning their mock survey in the second quarter on 2015.

B. HAPIE Study Phases

In 2011, USAID Indonesia commissioned the USAID Health Care Improvement (HCI) Project to conduct a study of hospital accreditation. The overall objective of the Hospital Accreditation Process Impact Evaluation (HAPIE) longitudinal study is to examine changes in quality and safety performance of nine hospitals: three undergoing the JCI accreditation process here after JCIs), two undergoing the new KARS accreditation process (hereafter KARSs) and four who will have no hospital accreditation until 2015 (here after NHAs). The HAPIE study is being conducted in three phases: baseline (completed August 2013), mid-line (current report) and end line (data collection planned for January 2016). Support for the study's midline and endline is being provided through the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project.

The specific objectives of the study are to analyze the differences and trends in the quality and safety of services among the three hospital groups over three years, estimate fees paid to consultants, facilitators and assessment organizations, and determine how the implementation of the accreditation programs is progressing from the perspectives of senior officials at the Ministry of Health, KARS, and the participating hospitals. The hypotheses are:

- There is a change in the quality of services and related patient outcomes and experiences in the hospitals associated with their undergoing the accreditation process.
- There is a difference in the change in the quality of services and related patient outcomes and experiences among the nine hospitals undergoing JCI accreditation, KARS accreditation or no accreditation.

The purpose of the midline phase of the study is to determine if there was any difference in the change in selected indicators of hospital performance from baseline to midline among the nine hospitals and if those differences were related to the type of accreditation they had undergone in that period. Quantitative data were collected using methods congruent to the the baseline evaluation. Qualitative data were also collected using methods consistent with the baseline with additional questions about the changes seen and the opinions there of from the baseline to midline periods.

C. Changes in Indonesia's Health System

One major confounder in the HAPIE study is the implementation of the new JKN (*Jaminan Kesehatan Nasional*) national health insurance program which began January 2014. JKN is a guarantee of health health insurance coverage for all people living in Indonesia as mandated by the Constitution (UUD) 1945 Section 28 H on the right of every person to obtain health care. When fully implemented as planned for 2019, it will be the largest single-payer health insurance system in the world, covering approximately 250 million people.

In order to provide universal health insurance, the implementation of JKN is being undertaken by the Social Insurance Board (BPJS) health as mandated by National Social Security Law 24 [**5**,**6**]. Government insurance mechanisms in place before January 2014 were merged into a single system and managed by the new BPJS health board in the first quarter of 2014. Insurance machanisms were Askes PNS (health insurance for civil servants and retired military personnel), Asabri (social insurance for active military and national police), Jamsostek (social insurance for formal workers in the private sector) and Jamkesmas (tax-funded health insurance for the poor and near-poor). As of the beginning of data collection for this midline of the HAPIE study, these separate pre-existing insurance schemes had been merged into one system covering approximately 30% of the Indonesian population.

Payments for drugs, devices and medical services provided to those presently covered by JKN are calculated individually based on what drugs, devices or services were dispensed, the type of hospital

or other health facility involved, its geographic location and the recipient's diagnosis (which indicates the cost-based group (CBG) to be used.

II. METHODS

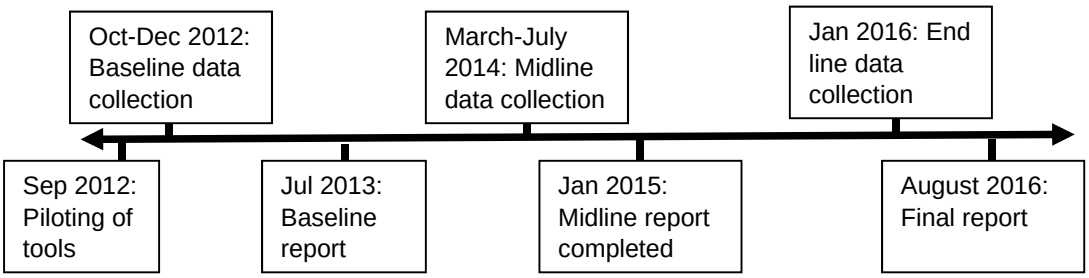
A. Study Design

There are five parts to this study as outlined in Table 1. The timeline for the study is given in Figure 1.

Table 1. Instruments and Sample Sizes

Instrument	Focus Information	Sources of Information	Method	Sample Size
Hospital Level Assessment				
Hospital Review	Hospital-wide quality management	Hospital Board, Hospital management, chiefs of departments/units	Document reviews, interviews, observations	-
Secondary Data	Hospital Description and Performance Indicators	Hospital Company Profile, Hospital Annual Report	Documents review	-
Department Level Assessment				
Obstetric	Department level quality management; facilities and services, patient care and information, resuscitation, clinical reviews, and Infection control	Department clinical directors, chiefs of wards	Documents review, interview, observation.	-
Pediatric				
Internal Medicine				
Surgery				
Clinical Chart Review				
Vaginal Delivery	Clinical service quality for vaginal delivery, pediatric pneumonia, acute myocardial infarction and hip fracture	Patients' medical records for vaginal delivery, pediatric pneumonia, acute myocardial infarction, and hip fracture	Review of clinical charts	270
Pneumonia				269
Acute Myocardial Infarction				274
Hip Fracture				235
Patient Experience	Patient satisfaction	Patients/family	Questionnaire	1087
Key Informant Interviews	Perceptions about accreditation and its implementation	Informant knowledgeable about accreditation (members of accreditation team, medical committee, safety committee, or Head of division)	In-depth interviews	55

Figure 1. Data Collection Timeline for HAPIE Study



Quantitative methods were applied to determine hospital service quality and performance and included clinical charts review for one of four conditions (normal vaginal delivery, pediatric pneumonia, acute myocardial infarction and hip fracture) and interviews from inpatients in four wards (obstetric, pediatric, internal medicine and surgery). We also collected data from observations and reviews of hospital documents, regulations, and policies along with interviews with key informants from all hospitals.

The hospital review captured data in ten domains. An organizational audit was conducted to describe the quality of care at the unit/department level within a hospital related to the four diagnoses listed above. A questionnaire captured patients' experiences with their care during their inpatient stay. A total of 55 key informants, most from hospital accreditation teams, were interviewed. There were two from each hospital except for the four from one hospital. The midline phase of the study was approved by the Institutional Review Boards of Universitas Indonesia and conducted with support from the Indonesian MoH. Hospital administrators gave permission for data collection to occur in their hospitals. All patients and informants interviewed were asked for their informed consent and precautions were taken to ensure their anonymity.

B. Sampling

The same nine hospitals that participated in the baseline study also consented to inclusion in this phase. The numbers for the samples of specific components of the study also remained the same (Table 1).

C. Data Sources

1. Hospital Review

This tool captured data on documentation of policies and practices in ten criteria:

1) Hospital Governance. Elements in this criterion include:

- Management has established an annual safety action plan and receives annual reports
- There is a leader for quality improvement and safety
- The hospital has a multidisciplinary group to coordinate quality improvement and safety
- Policy covering emergency preparedness for both internal and external critical situation has been set and available for all staff
- Medical laboratory and the diagnostic radiology is certified by International Organization for Standardization (ISO)
- Medical laboratory and radiology departments participate in formal external quality assurance

2) Patient Orientation. Elements in this criterion include:

- The hospital has approved and implemented a policy for obtaining informed consent and retained these records in the Medical Records Department
- The hospital has a policy for accommodating children in separate areas
- There are changing rooms for patients who are required to undress
- All patient complaints are investigated and responded to and complaints handling is published annually

3) Human Resources. The elements required are:
- Hospitals have a mechanism to verify professional qualifications in line with national law [**7**]
- Clinical staff are given Cardiopulmonary Resuscitation training with annual updates
- Records of all staff engaged in regular continuous professional development activities are maintained and audited to ensure compliance with adequate levels of continuing education
- Blood borne exposure control policy for staff has been defined

4) Clinical Practice and Patient Care. The elements include:
- The hospital has a formal procedure by which clinical guidelines are agreed upon and implemented [**7**]

- There are clinical groups established to coordinate the use of pharmaceuticals and therapeutics
- There are written guidelines on use of antibiotics and they have been adopted
- There is a specialist physician responsible for coordination of resuscitation services and training
- Resuscitation equipment and its diagrammatic are accessible, complete, clearly organized and fully functional
- There is documented protocol for process and information about patient transfers within and between hospitals

5) Health Care-Associated Infections. This criterion includes the following elements:
   - A multi-disciplinary group (Infection Control Committee) has been established and assigned to coordinate and take responsibility for infection control
   - An infection control manual or policies are accessible to staff in each department
   - Staff are appropriately trained in all aspects of infection control relevant to their work
   - Gloves are worn in all activities that have been assessed as carrying an infection risk
   - Safety/sharps boxes are available in sufficient quantities, are not overfilled and are disposed of adequately
   - Laboratories perform susceptibility testing for antibiotic-treated organisms
   - Food-handler staff are medically screened to exclude pathogen carriers before employment
   - There are clear signs that unauthorized entry into food preparation and service areas is not permitted
   - Hand washing facilities with disposable nail brush, soap dispenser, paper towels and pedal operated bins are available in all food preparation areas
   - Non-food items such as drugs, specimens or blood are not stored in the food fridges
   - All food-handling staff conform to a written dress code including headgear
   - Alcohol hand-rub available and accessible in every point of patient care
   - Surveillance data of hospital-acquired infections is performed annually

6) Transfusion. The three elements for this criterion are:
   - Blood for transfusion is stored in a designated lockable refrigerator
   - There is continuous record of blood bank temperatures, to ensure it is maintained consistently at an appropriate temperature
   - There is written guidelines concerning the prescription and administering of blood and blood products

7) Hospital Facilities Management. This criterion has the following elements:
   - Hospital has disabled access to all areas routinely visited by patients
   - All signs within the hospital are clear and coherent
   - Staff are protected by fume cabinets, extractors and ventilation systems in areas using hazardous substances
   - Compressed gas cylinders are secured to prevent falling when in use or stored in racks
   - Main gas stocks are securely stored separately from other materials
   - In the radiology area, there are signs warning women of the dangers of radiation for pregnancy
   - The hospital has a mechanism to monitor staff exposure of ionizing radiation and to identify high levels of exposure
   - All defibrillators are subject to maintenance programs by an electrical engineer or technician
   - Emergency generator(s) is tested on full load routinely
   - All firefighting equipment are inspected once a year with the date of inspection recorded, Pictograms indicating fire exits are illuminated, clearly visible, unobstructed and are conspicuously displayed at appropriate locations
   - Smoking is not allowed inside the hospital
   - The color of bags and the types of container are appropriate to each type of waste

- All staff who work in areas where clinical waste is handled are suitably trained and wear protective clothing

8) Medication Safety. This criterion includes the following elements:
   - The hospital should have a systematic procedure for reviewing the hospital formulary
   - The hospital's policy requires the use of international non-proprietary names
   - High risk medicines are included among nonemergency floor stock medicines in patient care areas
   - Pharmacists regularly check that medicines are stored properly
   - Infusions of complex and high risk medicines are prepared centrally by the pharmacy
   - Patients are provided with written medication information
   - Patient's identity is verified/double-checked
   - Medication doses are not removed from packaging or labeling until immediately before administration,
   - The hospital has adopted reporting guidelines about reporting near misses for medication errors

9) Surgery, Interventional Procedures and Anesthesia. The following elements are required:
   - The hospital has defined procedures for the pre-assessment of patients undergoing elective interventions under general anesthetic
   - There is a documented protocol for administering prophylactic antibiotics less than 60 minutes prior to an incision procedure
   - There is a monitored protocol where the operating practitioner unambiguously marks the operative site
   - The hospital has implemented and monitors use of the World Health Organization (WHO) Patient Safety Checklist
   - During anesthesia, tissue oxygenation is monitored using a pulse oximeter
   - The hospital has defined and implemented a policy for maintaining accurate, complete and signed surgical record within the patient medical record, and there is a documented protocol for discontinuing the administration of prophylactic antibiotics within 24 hours following an incision procedure

10) Documentation and Records. The following elements of this criterion are needed:
   - A policy for the physical identification of all patients
   - Patient records must contain sufficient information to identify the patient, provide a clinical history, details of investigations, treatment, medication and discharge details
   - There is only one set of case notes for each patient and it contains up-to-date patient identification with legible date and signed
   - Admission notes are completed prior to any surgical procedure except in emergencies
   - All diagnoses/procedures are coded in a standard system immediately upon patient discharges
   - Discharge summary is available to all patients, case note retention policy accordance to current national guidelines.

The hospital level assessment used an instrument examining elements of the criteria listed above, with a range of scoring 0 to 4 according to the definition given previously. This tool was designed by the SANITAS Project. The criteria were developed based on the European Union and international (including United Nations and WHO) guidance, research and legislation.

2. Organizational Audit

The organizational audit describes the quality of care at the unit/department level within a hospital for the four diagnoses of interest, i.e. in-patient ward, delivery ward, perinatal ward and Intensive Cardiac Care Unit (ICCU). The assessment used a tool validated from a previous study of the quality of hospital care, the DUQue Project.

3. Clinical Review

Chart reviews were conducted on four separate samples of the four clinical conditions. The reviews used tools developed and validated in the DUQuE project which were taken from the evidence-based clinical guidelines:

- National Institute of Clinical Excellence (NICE) in the UK Guideline 55 (for intra-partum care) and MoH, 2004 in Guideline of Normal Delivery Care [**8**,**9**].
- World Health Organization's case management on the pediatric ward for cough or difficult breathing and the British Thoracic Society annual national pediatric pneumonia audit UK.
- Hip and femur fracture
- American Heart Association Guideline for Acute Myocardiac Infarction (AMI) [**10**,**11**].

The tool was designed to capture whether or not specific evaluation, history-taking, and procedures were reported in the medical record in patients with one of the four diagnoses.

4. Patient Questionnaire

This tool captured patients' experiences with care they received during their inpatient stay. The questionnaire was adapted from the Nordic Patient Experiences Questionnaire (NORPEQ). The tool has been validated in Finland, Norway, Sweden and the Faroe Islands [**12**].

D. Revision of Indicators Evaluated in the Midline

Based on results in the baseline, there were minor changes to some indicators as outlined in Tables 2-5. For the indicators added, we were able to determine the responses from the baseline by inference of the data collected. For the indicators that were eliminated, it was because some questions were found to be irrelevant to the current hospital conditions. For example, fume cabinets were no longer used in the hospitals and non-food items were never stored in food fridges. Finance question in the hospital review have been removed to qualitative part because data were unavailable. Many question in the organizational audit were removed to the hospital review because they addressed management of the hospital overall, not the individual department.

1. Hospital Review

Additions and deletions in the hospital review instrument are summarized in Table 2.

Table 2. Additions and Deletions in Hospital Review Instrument

Hospital Review	
Additions	
Number	Data Captured
1.3M	Mechanism for determining the validity from the outcomes of clinical performance measures (feedback).
1.6	Hospital has a policy covering emergency preparedness/contingency planning (Crisis Preparedness Plan) for both internal and external critical situations, reviewed annually and available to all staff and implemented
1.11M	Hospital following the certification of quality assurance from the external parties
4.10M	Criteria and procedure of early transfer for patient to the referral was determined
6.4M	Availability and accessibility to the Blood Bank 24/7.
6.5M	Procedure for collection, identification, storage, transport, and blood disposal can be accessed by all staff.
6.6M	Mechanism of blood services for patients from outside the hospital.
7.12M	Implementation of the smoking ban was monitored in the hospital.
7.16M	Emergency room (ER) divided by triage, consist of resuscitation room, therapy room, and observation room.
7.17M	Out-stationed laboratory equipment (e.g., blood gas analysis) is calibrated, standardized and maintained by technicians from the main laboratory using the same procedures.

Hospital Review	
8.11 M	There is a policy of how drugs are brought by patient, was identified and stored by the hospital.
8.12 M	Compliance of prescription drugs is based on formulary standards at the hospital, reported January-December 2013
9.8M	Hospital established the filling process for surgical report completion to be done before the patient leaves the operative recovery area.
10.11M	Availability of policy about medical record removal.
10.12M	Hospital policy differentiates medical record between active and non-active
Deletions	
Number	Data Captured
5.11	Non-food items (drugs, specimens or blood) not stored in food fridges.
7.3	Staff are protected by fume cabinets, extractors and ventilation systems in areas using hazardous substances e.g., ethylene oxide, nitrous oxide, glutaraldehyde, cytotoxic drugs
11.	Financing Related to Quality and Safety
11.1	There is a system of patient financing using the case-mix costing, for example, Diagnostic Related Group or CBG
11.2	There is a budget for quality and safety improvement in hospitals (e.g., in-house or outside training related to the quality and safety improvement) • The budget assigned for improvement activities? • How many the budgets? (for each activity if possible) • What percentage of the budget compared to the total budget? (In the last 3 years)?
11.3	a. How the cost to get hospital accreditation (before last accreditation earned) excluding routine cost have been budgeted? b. How the cost to get hospital accreditation (cost for next accreditation) excluding routine cost has been budgeted? c. For JCI hospitals, how the details of the costs incurred?
11.4	Is there a compensation system for quality and safety coordinator?
11.5	In improving the quality and safety, are consultants used within last 3 years? • If so, for what activities? (e.g., mentoring accreditation, ISO, quality improvement training, etc.) • What cost for the consulting services?
11.6	What cost for certification to improve quality and safety (excluding consulting services)?
11.7	What costs to human resources and/or infrastructure investment to improve quality and safety?

2. Organizational Audit

Additions and deletions in the organization audit instrument are summarized in Table 3.

Table 3. Additions and Deletions of Organizational Audit Instrument

A. Organizational Audit – AMI	
Additions	
Number	Data Captured
AMI 8aM	Patient informed about their rights and obligations when admitted
AMI 8bM	Patients given access to their management plan on the ward/unit
AMI 12M	Adverse event reporting policy and system to patient safety committee
AMI 24M	All patient rooms allow privacy and dignity to be maintained.
AMI 31M	Resuscitation equipment (and access for a team) available on site at the wards
AMI 39M	a. Number of specialist doctor in one department, standby / on call when weekdays / weekend

	b. Number of specialist doctors who practice during the data collection process
AMI 40M	a. Number of residents in one department b. Number of residents who practice during the data collection process
Deletions	
AMI 21	Outstationed laboratory equipment (e.g., blood gas analysis) is calibrated, standardized and maintained by technicians from the main laboratory using the same procedures
AMI 23	Criteria and procedures are defined for early transfer of appropriate patients to a referral centre
AMI 38	During 2011 clinical review included analysis of reported events adverse to patients
B. Organizational Audit – Delivery	
Additions	
Number	Data Captured
D8aM	Patient informed about their rights and obligations when admitted
D8bM	Patients given access to their management plan on the ward/unit
D10M	Adverse event reporting policy and system to patient safety committee
D13	Baseline: During 2012, clinical review included analysis of routine clinical indicators on the management of maternity care Midline: During 2013, clinical review included analysis of structured medical audit on the management of maternity care
D17M	There is policy about emergency obstetric care in emergency room
D19M	All patient rooms allow privacy and dignity to be maintained.
D21M	Resuscitation equipment (and access for a team) available on site at the wards
D24aM	There is separation room from sick and healthy newborn
D24bM	The separation room for newborns with intensive medical needs
D31M	Each emergency "crash cart" has a completed checklist of equipment and supplies
D32M	a. Number of specialist doctors in one department b. Number of specialist doctors who practice during the data collection process
D33M	a. Number of residents in one department b. Number of residents who practice during the data collection process
D34M	There is a policy about episiotomy
D35M	All delivery patients educated about the treatment of exclusive breastfeeding
D36M	Written policy regarding the implementation of Early Initiation of Breastfeeding and management of award of exclusive breastfeeding
D37M	Hospital has a policy about of recording the baby's medical record into mother's medical record status
D32M	a. Number of specialist doctors in one department b. Number of specialist doctors who practice during the data collection process
D33M	a. Number of residents in one department b. Number of residents who practice during the data collection process
D34M	There is a policy about episiotomy
D35M	All delivery patients educated about the treatment of exclusive breastfeeding

D36M	Written policy regarding the implementation of Early Initiation of Breastfeeding and management of award of exclusive breastfeeding
D37M	Hospital has a policy about of recording the baby's medical record into mother's medical record status
C. Organizational Audit- Hip Fracture	
Additions	
Number	Data Captured
Hip 18M	Adverse event reporting policy and system to patient safety committee
Hip 20aM	Patient was informed about their rights and obligations when admitted
Hip 20bM	Patients are allowed access to their management plan on the ward/unit
Hip 25M	All of patient rooms allow privacy and dignity to be maintained.
Hip 32M	Resuscitation equipment (and access for a team) available on site at the wards
Hip 35M	a. Number of specialist doctors in one department b. Number of specialist doctors who practice during the data collection process
Hip 36M	a. Number of residents in one department b. Number of residents who practice during the data collection process
Deletions	
Hip 15	Criteria and procedures are defined for early transfer of appropriate patients to a referral centre
Hip 25	Average number of beds per room (total number of beds/ total number of rooms)
D. Organizational Audit-Pneumonia	
Additions	
Number	Data Captured
P1M	Patient was informed about their rights and obligations when admitted
P13M	Adverse event reporting policy and system to patient safety committee
P18M	There is written policy or procedure about administering oxygen to children
P21M	Monitoring mechanism or procedure of administering oxygen by nasal prongs or nasal catheter
P22M	Resuscitation equipment (and access for a team) available on site at the wards
P25M	All of patient rooms are enabled to privacy and dignity to be maintained.
Deletions	
Number	Data Captured
P24	Criteria and procedures are defined for early transfer of appropriate patients to a referral centre
P25	Average number of beds per room (total number of beds/ total number of rooms)

3. Clinical Review

Additions to the clinical review instrument are summarized in Table 4.

Table 4. Additions to the Clinical Review Instrument

A. Clinical Review-AMI	
Number	Data Captured
2.25M	Is patient diagnoses recorded completely?

2.30M	Was coronary angiography performed in the hospital?
3.1M	Diagnosis
3.11M	Was there any indication of antibiotic recorded?
B. Clinical Review-Delivery	
Number	Data Captured
2.2aM	Information of GPA (gestation, parity, abortion)
2.7aM	Partograph completion
2.7bM	Was the patient have complications during labor ?
2.7cM	Specify the types of complications
2.7dM	Was the inspection FHR (Fetal Heart Rate) performed during childbirth
2.18M	How many times was Hemoglobin (Hb) checked during hospitalization?
2.19M	Maximum Hb during hospitalized (gr/dl)
2.31M	Adverse events:
3.11M	Was medical summary or discharge summary for patient filled in?
3.12M	Was there a link among the mother's medical record and the baby's medical record
C. Clinical Review-Hip Fracture	
Number	Data Captured
2.5M	Doctor state surgery indicated
2.17M	Type of hip surgery
2.22T	Were there any adverse events recorded:
3.1M	Diagnose
D. Clinical Review-Pneumonia	
Number	Data Captured
4.8aM	Temperature
4.8bM	Respiratory rate (per minute)
4.8cM	Pulse rate (per minute)
4.8dM	Ronchi
4.8eM	Wheezing
4.8fM	Chest in drawing
7.1M	Diagnose

4. Patient Experience

Additions to the patient experience instrument are summarized in Table 5.

Table 5. Additions to Patient Experience Instrument

Patient Experience	
Number	Data Captured
2aM	Ward Class
A.9	Additional option for payment system
B.15aM	Was patient given explanation of breastfeeding? Reasons/Comments
B.15bM	During treatment in hospital, were you encouraged to breastfeed your baby? Reasons/Comments

B.16M	information given by staff (doctor / midwife / care staff) at the time of the staff giving the medication
B.17M	Was the patient's identity checked beforemedication given?
B.18M	Was the patient explained on the rights of patients
B.19M	Patients use a bracelet with name, medical record number, and date of birth.

E. Data Collection

Table 6 summarizes the data collection instruments applied in the midline assessment.

Table 6. Data Collection Instruments and Their Use

Instrument	Scale	Domains	Source	Comments
Hospital review	0 = No or negligible compliance (< 5%) 1 = Low compliance (6-40%) 2 = Medium compliance (41-65%) 3 = High, extensive compliance (66-94%) 4 = Full compliance (>95%)	Hospital governance	Observations at facilities supplemented with interview with management level	Scoring scale based on SANITAS
		Patient orientation		
		Human resources		
		Clinical practice / patient care		
		Healthcare-associated infections		
		Transfusion services		
		Facility Management		
		Medication Safety		
		Surgery, procedures and anesthesia		
		Documentation and records		
Organizational audit	0, 2, 4	Management at department level and specific case management for: • Normal vaginal delivery	Ward chiefs, specialists confirmed with observations where possible	Many overlapping criteria in the four domains
		• Pediatric pneumonia		
		• Acute myocardial infarction		
		• Hip & femur fracture		
Clinical Review	Mostly binomial or categorical variables	Normal vaginal delivery	Patient medical records	
		Pediatric pneumonia		
		Acute myocardial infarction		
		Hip and femur fracture		
Patient Questionnaire	Categorical 1 to 4 scale	Obstetric	Questionnaire by interview	NORPEQ
		Pediatric		
		Cardiology/Internal medicine		
		Orthopedic/Surgery		
Hospital-based data	Mostly counts	Hospital-wide	Secondary data collection	
Stakeholder interview	Open-ended questions	Hospital –wide KARS, MoH	Qualitative interview	

Data collection was conducted in the same manner for the midline phase as the baseline, often with the same data collection staff visiting the same hospitals and all data collectors were trained for three days using the new instruments. Visits at baseline took about one week in each of the nine hospitals, but two weeks were generally needed in the midline phase. For data on patient experience, the implementation of JKN resulted in fewer inpatients being discharged on any given day.

The period for the clinical review in the midline phase was one year (Jan-Dec 2013), but for hip fracture cases we considered for 18 months (July 2012-Dec 2013) in order to capture the required sample size. However, even with intensive searching in the medical records, there were three hospitals where the samples did not meet the target: Hospitals E, H and I.

During collection of qualitative data, questions were asked about accreditation as before, and questions about changes related to implementation of JKN were added. Questions explored additional topics such as hospital financing, information management system for recording and reporting and service mechanism related to implementation of JKN and how these may have related to accreditation and quality of services.

There were no significant constraints on data collection during the midline study. However, not all data collectors obtained all secondary data and supporting documents required for the ward audit and hospital reviews. This was because of document control policies or the absence of staff who could provide such documents not being present during data collection.

1. Hospital Review

In collecting data of hospital review, the following steps were taken:

- Key informants from the units involved in the study were identified and asked to be interviewed once informed consent was given. Informants were heads or managers of staff of wards, human resources, public relations, blood banks, occupational health and safety, medical services, pharmacy, medical records, laboratories, radiology or similar positions. Official consent of the study was obtained from the Hospital Director. Hospitals issued letters internally to related units to participate in the study. Information from interviews was verified with secondary data (reports, hospital surveys, and SOP and meeting minutes).
- Observations of hospital facilities and operations were conducted to determine the current situation, and documented through photographs when appropriate.

This review was intended to cover the whole hospital and therefore included all active as follows:

- Management: medical services, education and training, human resources, finance, pharmacy, public relations unit.
- Heads of Units: emergency rooms, operating theatres, delivery wards, perinatal ward, intensive cardiac care units, waste management, food handling, intensive care, pharmacy maintenance, in-patient wards.
- Hospital committees: quality improvement and safety, infection control and prevention, pharmacy and therapy, occupational health and safety, medical committee.

In some cases, the primary relevant informants were not available during the data collection period. In those situations, data collectors sought alternative informants in related units who were likely to have the appropriate information. For example, when we could not meet the leader of the accreditation unit, we sought other accreditation team members. When alternative informants could not be interviewed, the information column was written “Not Available” and not included in the analysis. All information obtained from interviews were verified through documentations (reports, guidelines, regulations) and observation to all relevant unit (use of bracelet and safety boxes in patient wards). Scoring was based on SANITAS criteria, with maximum scores given when the information could be verified with appropriate documentation and was consistent with the actual findings of the data collectors. Data were then entered into an Excel data sheet in the field.

2. Organizational Audit

Information was sought mainly from the chief of the ward/unit and specialist responsible for medical care in the ward/unit. The area of assessment was the in-patient ward and other relevant units. For example, the delivery ward was checked for information of maternal cases while the cardiac intensive care unit was checked for all information relevant to treatment of those with AMI, and the emergency department and operating theatres were audited for all information pertinent to hip fracture. Information was then verified through a review of records and observations. Similar to the hospital review, a maximum score was given when the information was verified with appropriate documentation and was consistent with findings in the service delivery units. In some cases, information needed to be validated against other relevant informants such as Medical Committee members and heads of department. Data were then entered into an excel sheet in the field.

3. Clinical Review

The clinical review was based on the patient medical records. Data collection teams selected cases at random based on pre-determined diagnostic groups (see Table 7). At first, the team listed all cases with the diagnoses of interest during a period of one year preceding the data collection date. When the number of cases within that period was less than the sample size needed, cases were drawn from a longer period. Despite the small number of hip/femur fracture cases, we limited the data period up to 18 month before the study by looking at surgical registers. The number of hip fracture cases sampled was 30 in all but three hospitals: I (10 cases), H (29 cases) and E (16 cases). The variables of interest for each diagnostic group are listed in Table 8. Information extracted from patients' clinical charts was checked for error and inconsistency.

Table 7. Clinical Conditions for Patient Record, Patient Experience

Ward	Diagnosis
Obstetrics	Vaginal delivery
Pediatrics	Pneumonia
Surgery	Hip & femur fracture
Internal medicine	Acute myocardial infarction

Table 8. Data Collection from Chart Reviews

Diagnostic group	Variables
Vaginal delivery	Labor initiation
	Outcome of delivery (newborn)
	Maternal diagnosis (PPH, eclampsia etc.)
	Episiotomy / Laceration
	Active management of the third stage of labor (1 min post-partum uterotonic)
	Immediate breastfeeding
Pediatric pneumonia	Completeness of evaluation
	Routine monitoring
	Appropriate use of antibiotics
	Oxygen
	Discharge status
	Adverse events
	Completeness of evaluation

Diagnostic group	Variables
Acute Myocardialc Infarction	Routine monitoring
	Appropriate use of medications
	Discharge status
	Adverse events
Hip and femur fracture	Completeness of evaluation
	Routine monitoring
	Appropriate use of prophylaxis
	Early mobilization
	Discharge status
	Adverse events

4. Patient Interview Questionnaire

A randomly selected sample of patients was given the questionnaire which contained questions about the patients' experiences at the hospital for the present episode of care. Patients were selected from any one of the four departments: obstetrics/gynecology, pediatric, internal medicines and surgery. All were interviewed on the day of their discharge as close as possible to the time they were exiting the hospital. The data collection team intended randomly selecting patients for interview on one specific day during the data collection period. However, this was not feasible in all hospitals because the number of patient discharged per day was smaller than in the baseline due the JKN changes as noted below, especially in obstetric cases. In Hospitals B and D, the team extended the data collection to two days while in Hospitals D, E, and B, data collection was expanded to gynecology patients (within the same department as the obstetrics) because the number of patients discharged following childbirth was not adequate to fulfill the sample size requirements in two days. As with the clinical review data, completed questionnaires of patient interviews were checked for errors and inconsistencies during data entry.

5. Hospital-based Data

Secondary data were collected from each hospital where possible on service quality, hospital company profile, hospital performance indicators, policies on regulations in all aspects, adverse events, and the formulation of committees to address deficiencies in patient care or hospital operations and, when available, the costs related to accreditation preparation.

Data were obtained from various unit such as the medical record unit, medical services unit, human resources unit and finance department. Data included annual reports, hospital performance indicators, financial statements, maternal death reports, clinical practice guideline, organizational structure, clinical pathways and adverse event reports. The degree of data completeness varied among hospitals.

6. Stakeholder Interview

Informants interviewed during the midline study were key informants in accordance with criteria required by the qualitative study and most were the same as at baseline. Most were still in similar position as at the baseline. If informants from the baseline had moved to another position during midline, the team still attempted to conduct interview separately.

Interviews with stakeholders such as Chief of Medical Services, Hospital Accreditation Team, Finance Manager, Unit of hospital information system, and the Health Insurance Unit aimed to understand their opinions on the purpose of hospital accreditation, how the accreditation program was progressing from the perspectives of senior officials at participating hospitals, KARS, and MoH, and how the accreditation process influences the quality of care available delivered at the hospital in the

future. It also asked about changes in medical services and management since accreditation, hospital finances concerning accrediation, and changes in hospital policy regarding JKN.

Key informants included the Vice Director or the Head of Medical Services and the Head/Members of the accreditation teams. Using a snowball sampling technique, other informants were defined in the field. Table 9 list the informants involved in the study.

Table 9. Informants' Characteristics

Position	Number
Hospital Director	5
Medical Services	9
Insurance Claim	4
Finance and Budgetting	15
Hospital Quality and Accreditation	7
Medical Record and Hospital Information	8
Head of Department (SMF)	7
TOTAL	55

F. Data Analysis

A profile of each hospital was generated to include basic parameters such the number of bed and surgical suites and the number of staff. It also included any specific details that the research assistants noted during their visit that were not recorded in other tools.

For the hospital review and organizational audit, once hospital visits were completed, the research team gathered to discuss the results to ensure standardization of scoring. It should be noted that a score of minimum compliance does not necessarily mean the standard is not in place at all. In some cases, information could not be verified with documentation although informants mentioned that the documentation was available, but not at the time that the data collector was there, because the person in charge was not in place or the supporting documents could not be located.

For the hospital review and organizational audit, the research team discussed the results obtained to ensure standardization of scoring. Hospital Review data were scored against standardized criteria using a 0-4 rating (0 is non-compliant, 4 is fully compliant). Organizational audit data were scored 0, 2 and 4. Data from clinical chart reviews and from patient experience questionnaires were analyzed by individual hospitals. Stakeholder interviews were recorded, transcribed and analyzed. Descriptive analysis was done to all variables. Chi-square statistical tests were used to examine associations between variables.

Descriptive analyses were done on all variables. Variables for which the unit of analysis was the patient (clinical review or survey), statistical test were applied.

o determine the difference between the baseline and midline data infor clinical chart review and patient interview in each category of hospital, adjusting for covariates such as patient age and the type of insurance coverage reported.

1. Hospital Review

Measurement of hospital compliance against the SANITAS criteria used the rating scale of 0-4. The scale represented the range from no or minimal compliance scoring 0 (e.g., in less than 5% of instances) to total or maximal compliance scoring 4 (e.g., compliance in more than 95% of instances). A middle score of 2 represented compliance in a midway between these two extremes. If a hospital had a higher compliance than 5% but did not meet the criteria for the middle score, then a score of 1

was assigned; if compliance exceeded the middle score but was not fully compliant, then a score of 3 was assigned [**13**]. These scores were simply compared from baseline to midline.

2. Organizational Audit

Organizational audit data were given an ordinal score where 0 was for no or minimal compliance; score 2 was for medium compliance and 4 was for total or maximal compliance.

3. Clinical Review

Data from the clinical review were analyzed based on category that had been set, such as respondent characteristic, admissions, incompleteness of physical examination of pneumonia, completeness of laboratory examination for AMI patients, etc. The computed variable in each criterion are the critical elements performed in each diagnosis.

4. Patient Questionnaire

Patient experience data were analyzed based on hospital group (JCI, KARS, NHA), as well as individual hospital in each group. Data on patient characteristics included the respondents' highest education, age, sex, method of payment, and length of stay. Descriptive statistics were used for data on communication, satisfaction, hospitality, willingness to recommend the hospital to others, facilities worthiness, confidence in the clinical staff, and clarity of doctor's discharge instruction.

5. Hospital-based Data

Hospital-based indicators were analyzed between hospitals. This consisted of a hospital's background or status (accreditation status, type, teaching hospital or not, number of patients, number of beds, etc.) and hospital performance indicators (BOR, LOS, TOI, NDR, emergency response time, hospital-acquired infections and other adverse events.)

6. Stakeholder Interview

Interview transcripts were entered directly into a matrix based on the themes of interest. Qualitative data were audio-recorded and interview transcripts were developed and grouped according to the themes studied.

G. Ethical Considerations

Before agreeing to participate in the study, each hospital was informed of the data collection procedures for patients and staff including the time commitment, access to records, and feedback or sharing of results. Senior management and staff in relevant departments were formally briefed in advance on the nature and purpose of the study.

All study participants were assured that no individual identifying information would be recorded or used. As part of the informed consent process, all participants were be assured of their right to decline participation at any time during the interviews. All individuals, including managers, were assured that results from the study would be kept confidential and that only the research team would have access to raw data.

Patient interviews were conducted in separate rooms where staff and other patients could not overhear any part of the conversation. Participants were assured that their responses would not be communicated back to any hospital staff and that staff would not be informed of their participation.

H. Issues on Categorization of Studied Hospitals

During development of this study, hospitals were chosen based on three hospital categories with three hospitals in each category.The classification was made based on their existing accreditation status and their plans between 2013 and 2016 determined from consultation with the MoH and hospital management. However, during this period, accreditation status and plans ofsome hospitals have changed such as Dr. Kariadi Hospital underwent their JCI mock survey in May 2014, while M. Hoesin Hospital was planning their JCI mock survey on 2015. Persahabatan Hospital planned to undergo KARS accreditation in 2015.

In 2012, Persahabatan Hospital was designated by the Ministry of Health to undergo JCI accreditation after undergoing KARS (2012) accreditation. However, Persahabatan was not ready for KARS (2012) accreditation because of deficiencies in facilities and infrastructure. Changes were also needed to meet patient safety and human resource management standards. M. Husein Hospital is also expected to seek JCI accreditation in 2015. Hospital management felt it could not yet meet all JCI standards but efforts were underway to improve systems and services to meet JCI standards. The hospital attempted KARS accreditation in 2014, and they succeeded in January, 2015. In Kariadi Hospital, according to one informant in management, they strive to meet both KARS and JCI accreditation using their own budget in 2015 without the mandate from the MoH.

III. RESULTS

A. Clinical Charts and Patients Discharged

The data collection aimed to perform clinical chart reviews on 30 casenotes for each diagnosis (vaginal delivery, pneumonia, acute myocardial infarct, and hip/collum femur fracture. The sample was selected randomly among admission in the 12 months prior to data collection, but for hip fracture diagnosis was expanded to one and half years because the cases were too few to meet the quota for 30 otherwise. When there were more than 30 admissions to choose from, the sample was selected randomly. Table 10 shows the number of charts reviewed in each category.

B. Hospital Review

Out of the nine Class A hospitals, eight are main teaching hospitals and one is an affiliate teaching hospital. Every one has an area of focus (Center of Excellence) for medical service, such as trauma medicine, respiratory diseases, emergency medicine and cardiology. Table 11 lists key characeteristics of the nine hospitals.

1. Hospital Performance Indicators

Performance indicators are data that reflect the extent to which an anticipated outcome is achieved or the quality of the processes leading to that outcome to which the standard has been set. Data collected in the nine hospitals include:

- Bed Occupancy Rate (BOR)
- Average Length of Stay (ALOS)
- Turn Over Interval (TOI)
- Bed Turn over (BTO)
- Emergency Response Time
- Proportion of Deaths in the ER (%)
- Net Death Rate (NDR)
- Gross Death Rate (GDR)
- According to the MoH standard, number of health care-associated infections should be < 1.5%
- Waiting time for prescription drug service should be less than 30 minutes
- Waiting time for preoperative should be no more than two days

Results are reported in Table 12. Some hospitals have incomplete data on performance indicators either because hospitals did not include medical services standard into their annual report, or because they have no annual report.

Table 10. Samples Acquired from Hospitals

Variable	Hospital																			
	A		B		C		D		E		F		G		H		I		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Clinical Chart Review																				
Vaginal Delivery	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	270	270
Pneumonia	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	270	269
AMI	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	34	270	274
Hip / femur fracture	20	30	30	30	8	30	30	30	7	16	5	30	16	30	23	29	7	10	146	235
TOTAL	110	120	120	120	98	120	120	120	97	106	95	120	106	120	113	119	97	103	956	1048
Patient interview																				
Obstetric Dept.	29	30	31	30	30	30	31	30	29	32	30	30	30	30	36	30	35	31	281	273
Pediatric Dept.	29	30	28	30	30	30	31	30	30	30	32	30	31	30	24	30	29	30	264	270
Internal Medicine Dept.	30	30	32	30	31	30	32	30	29	31	29	31	30	30	30	30	29	30	272	272
Surgery Dept.	30	30	31	30	31	30	32	30	29	31	29	31	30	30	24	30	27	30	263	272
TOTAL	118	120	122	120	122	120	126	120	117	124	120	122	121	120	114	120	120	121	1080	1087

B = Baseline; M =Midline

Table 11. Hospital Description

Variables	Hospital								
	A	B	C	D	E	F	G	H	I
Year of Last Accreditation	2013 (KARS-2012; JCI)	2014 (KARS-2012; JCI)	2013 (ISO 9001)	2013 (KARS-2012)	2008 (KARS-2007)	2011 (KARS-2007)	2011 (KARS-2007)	2011 (KARS-2007)	2012 (KARS-2007)
Year of Next Accreditation (Prediction)	2016 (KARS-2012; JCI)	2017 (KARS-2012; JCI)	2014 (KARS-2012)	2014 (Final JCI survey Dec 2014)	2015 (MOCK survey JCI 2018 (KARS-2012))	2015 (KARS-2012)	2015 (KARS-2012)	2015 (KARS-2012)	2014 (MOCK survey of KARS-2012on Dec)
Teaching Status	Afilliate Teaching	Main Teaching	Main Teaching	Main Teaching	Main Teaching	Main Teaching	Main Teaching	Main Teaching	Main Teaching
Center of Excellent	Orthopedic & Medical Rehabilitation	Geriatrics, Heart, Oncology	Nuclear Medicine	Geriatrics , Epilepsy, Surgery, Leptospira	Brain and Heart Center (BHC)	TB Dots, Pulmonology Intervention, Respiratory Intensive Care Unit (RICU),	MRI, Laboratorium, Emergency	Heart	Cardiac Center
Facilities									
ICU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICCU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NICU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PICU	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
HCU	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 12. Hospital Performance Indicators

Variables	MoH Standard *	JCI						KARS							NHA				
		A		B		D		C		E		F		G	H			I	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
BOR (%)	60 – 80	73	70	76	76	88	82	71	80	86	82	76	67	75	70	67	NR	80	85
ALOS (days)	6 – 9	7	6	7	7	8	8	7	6	7	9	7	6	7	6	8	NR	7	5
TOI (days)	1 – 3	2.5	1.9	2.1	2.3	1	1.6	3	2	1.2	NR	1.8	2.9	2.3	2.6	4.1	NR	1.6	NR
BTO (times)	40 – 50	41	41	40	39	42	39	NR	49	46	NR	48	41	40	42	29	NR	44	NR
Emergency Response time (minutes)	< 5	< 5	< 5	< 5	5	2	0	< 5	5	5	5	5	4	1	1	15	NR	15	5
Number of Death in ER‰	<2	2	3	NR	1%	5	1%	17	2	9	3	0	1%	0	6%	NR	NR	NR	0
NDR (‰)	< 25	50	51	20	52	46	49	41	40	42	43	4	4	6	3	NR	NR	NR	NR
Waiting time for prescription drug service (minutes)	≤ 30 minutes	38	8-30	< 30	18	20	41	NR	< 30	> 30	8	50	12	9	7	15	15	15	15-30
Post-Operative Death Rate	3	1	1	NR	2	0	1	NR	1	4	2	0	0	0	NR	NR	NR	NR	1
Waiting time pre-operative (days)	≤ 2	2	1-2	1	2	2	1	NR	NR	9	9	3	1-2	7	7	1	Not standardized	NR	5
Adverse events (%)	0	NR	Surgical wound infection (0.9%); Phlebitis (6.6%);	0	Nosocomial infections (0.9%)	0.45	Nosocomial infections (0.3%)	NR	Nosocomial infections (1.6)	NR	Nosocomial infections (0.9)	NR	Surgical wound infection (0.1%); Infusion infection (0.7%);	0.03	Nosocomial infections (0.7%)	NR	Nosocomial infections (< 1.5%); Decubitus (≤1.3%);	NR	Nosocomial infections (0.0)

Variables	MoH Standard *	JCI						KARS							NHA				
		A		B		D		C		E		F		G	H			I	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
			Decubitus (1.1%); UTIs (1.1%)										Decubitus (0.3%); UTIs (0.0%)				Falls (≤0.2%); Phlebitis (≤1.5%)		
Number of Judicial Discharge (%)	≤ 5%	NR	NR	2	1%	NR	NR	NR	6%	NR	2	NR	NR	11	5	NR	2	NR	NR

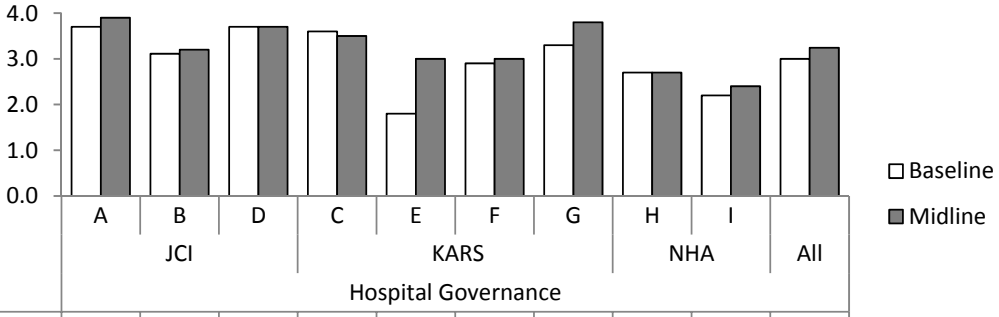
B = Baseline; M =Midline

There are ten composite domains made from more than 80 elements in the hospital review instrument. The domains are: 1) hospital governance, 2) patient orientation, 3) human resources, 4) clinical practice and patient care, 5) health care associated infection, 6) transfusion, 7) facilities management, 8) medication safety, 9) surgery, interventional procedures and accompanying anesthesia, and 10) documentation and records. Each element of the domains was scored 0 to 4, with 4 being the highest, then averaged across all elements in the domain.

1) Hospital Governance consists of:
- Annual safety strategy/action plan in the hospital
- Reporting on quality and safety
- Clinical performance reports
- Designated leader for Quality Improvement (QI) and safety
- Multi-disciplinary group for QI and safety
- Internal/external emergency preparedness plan
- Certified laboratory and diagnostic radiology
- External validation of laboratory and radiology

The score of hospital governance domain ranged from 1.8 to 3.7 (mean 3.0) in the baseline and 2.4 to 3.9 (mean 3.2) in the midline (Figure 2). Hospitals A, E, and G showed increases from baseline to midline period while Hospital C had a slight decrease.

Figure 2. Summary for Hospital Governance in Nine Hospitals by Phase by Group

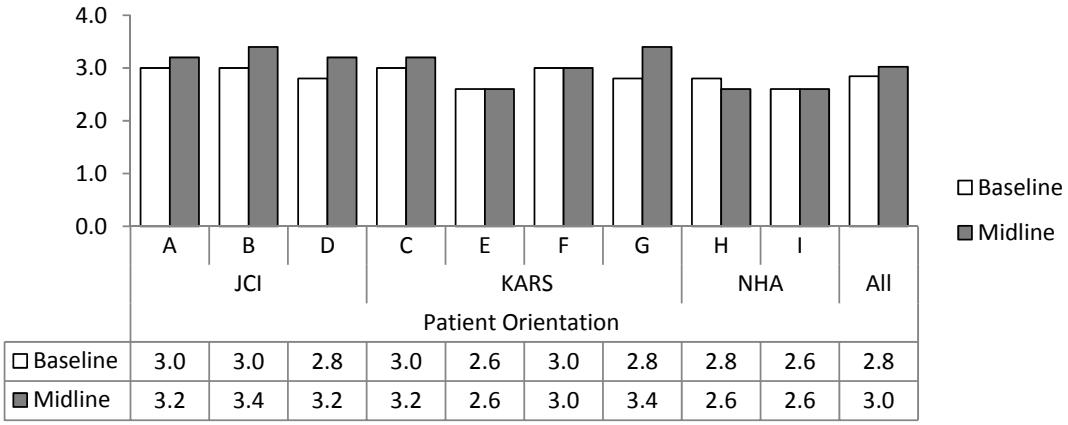


	A	B	D	C	E	F	G	H	I	All
Baseline	3.7	3.1	3.7	3.6	1.8	2.9	3.3	2.7	2.2	3.0
Midline	3.9	3.2	3.7	3.5	3.0	3.0	3.8	2.7	2.4	3.2

2) Patient Orientation domain was comprised of the followings:
- Informed consent attached in medical records
- Children separated from adults
- Privacy for undressing/changing
- Patient complaints are investigated and responded to
- Annual report on complaints handling is published

JCI hospitals showed an increases as did Hospitals C and G (KARS). Only Hospital H among NHA hospitals showed an increase (Figure 3). Average scores for all hospitals increased from 2.8 to 3.0.

Figure 3. Summary for Patient Orientation in Nine Hospitals by Phase and Group



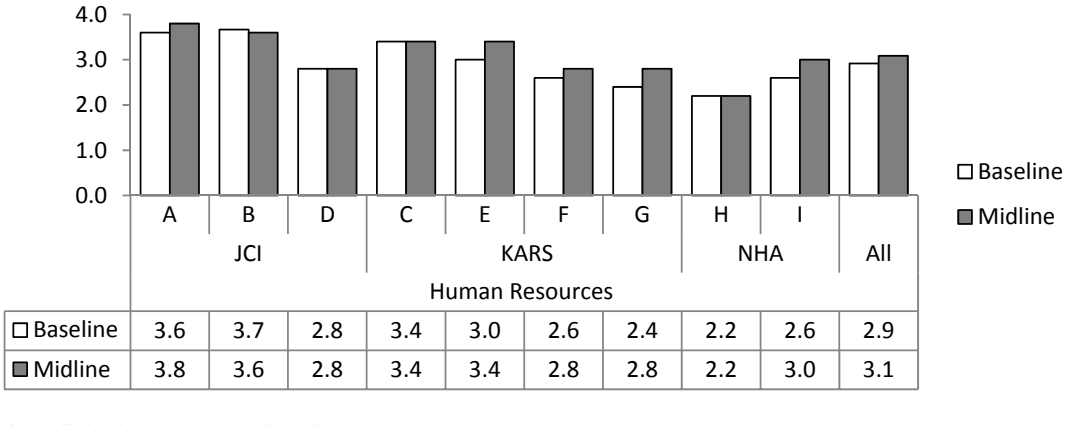
	A	B	D	C	E	F	G	H	I	All
Baseline	3.0	3.0	2.8	3.0	2.6	3.0	2.8	2.8	2.6	2.8
Midline	3.2	3.4	3.2	3.2	2.6	3.0	3.4	2.6	2.6	3.0

3) Human Resources domain elements are:

- Verification of professional credentials
- Cardio-pulmonary resuscitation training according to international guidelines
- Continuing professional development recorded for all relevant staff
- Defined blood borne exposure control policy
- Annual staff satisfaction survey

As shown in Figure 4, Hospital B (JCI) showed a decrease while KARS hospitals showed an increase or were unchanged. Among NHA hospitals, only Hospital I showed an increased. The average score for all was 2.9 at baseline and increased to 3.1.

Figure 4. Summary for Human Resources in Nine Hospitals by Phase by Group



	A	B	D	C	E	F	G	H	I	All
Baseline	3.6	3.7	2.8	3.4	3.0	2.6	2.4	2.2	2.6	2.9
Midline	3.8	3.6	2.8	3.4	3.4	2.8	2.8	2.2	3.0	3.1

4) Clinical Practice and Patient Care

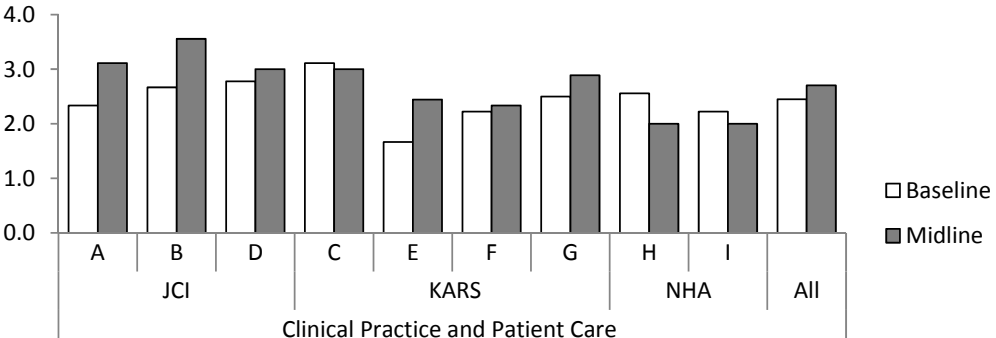
The nine elements in this domain are:

- There is a defined mechanism for medical staff accountability for the quality and safety of medical care
- Clinical guidelines (medical service standards) in each departments are agreed upon and implemented
- The clinical group that exists coordinates the use of pharmaceuticals and therapeutics across the hospital (hospital formulary, prescribing, usage, etc)
- There are guidelines on the use of antibiotics to reduce risk of resistance
- There are guidelines on the use of prophylactic antibiotic
- There are specialists designated as responsible for resuscitation services and training

- Resuscitation equipment is in order and diagrammatic instructions are available in resuscitation areas
- There is a documented protocol for transferring patients within or outside of the hospital

Scores for clinical practice and patient care criteria ranges from 1.7 to 3.1 (mean 2.5) at baseline and generally increased from 2 to 3.6 (mean 2.7) (Figure 5). All JCI hospitals increased and all KARS hospitals except Hospital C also increased. All hospitals NHA decreased. Those hospitals were decreasing due to a lack of resuscitation equipment and diagrammatic instructions and guidelines on antibiotics use.

Figure 5. Summary for Clinical Practice and Patient Care in Nine Hospitals by Phase by Group



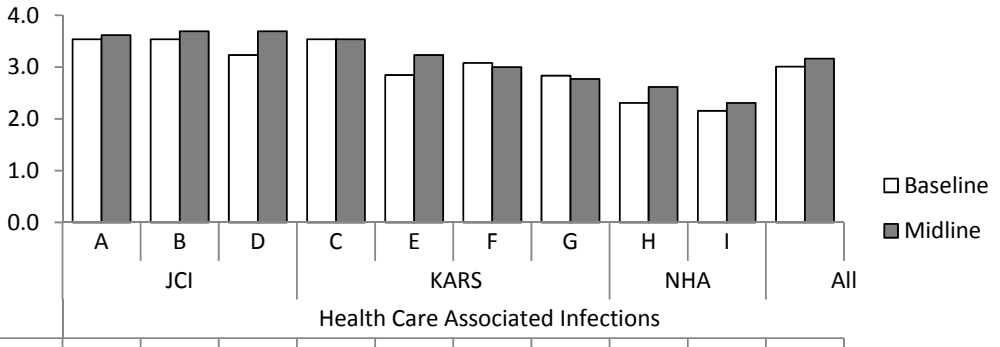
	A	B	D	C	E	F	G	H	I	All
Baseline	2.3	2.7	2.8	3.1	1.7	2.2	2.5	2.6	2.2	2.5
Midline	3.1	3.6	3.0	3.0	2.4	2.3	2.9	2.0	2.0	2.7

5) Health care-associated infections domain has 14 elements:

- Multi-disciplinary infection control committee
- Accessible infection control manuals
- Team responsible for daily infection control activities
- All staff trained on infection control appropriate to their risks in workplace
- Gloves worn when needed
- Single-use injections and safety boxes available
- Laboratory perform susceptibility training
- Medical screening of food handlers
- Exclusive signs for food preparation areas
- Separate hand-washing areas for food-handling areas
- Non-food items not stored in food fridges
- Food handling staff adhere to dress code
- Staff have adequate access to alcohol-based hand-rub
- Analysis of hospital-acquired infection data

The average scores for all nine hospitals increased by 0.2 with only Hospitals F and G (KARS) showing a decrease (Figure 6).

Figure 6. Summary for Health Care Associated Infections in Nine Hospitals by Phase by Group



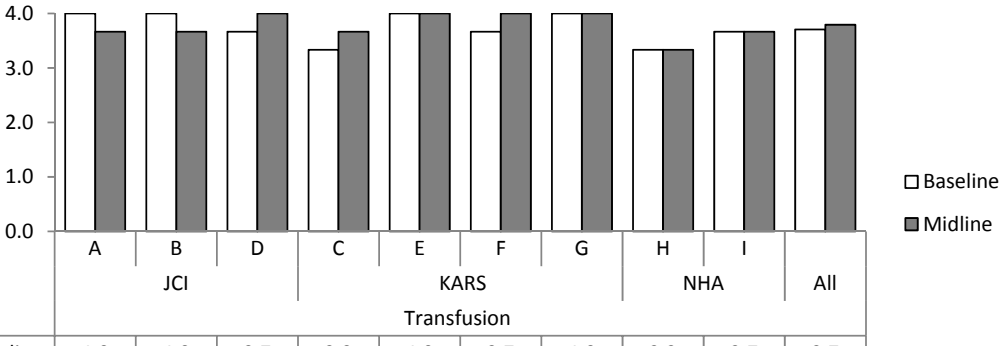
Baseline	3.5	3.5	3.2	3.5	2.8	3.1	2.8	2.3	2.2	3.0
Midline	3.6	3.7	3.7	3.5	3.2	3.0	2.8	2.6	2.3	3.2

6) Transfusion domain was made up of the following elements:

- Blood stored in lockable designated refrigerator
- Refrigerator temperature records are kept for reference
- Written guidelines for prescription and administration of blood were used

Overall, transfusion criteria had increased from 3.7 to 3.8. Two of three JCI hospitals decreased while two KARS hospitals improved and two remained unchanged and there was no change in the NHA hospitals (Figure 7).

Figure 7. Summary for Transfusion in Nine Hospitals by Phase by Group



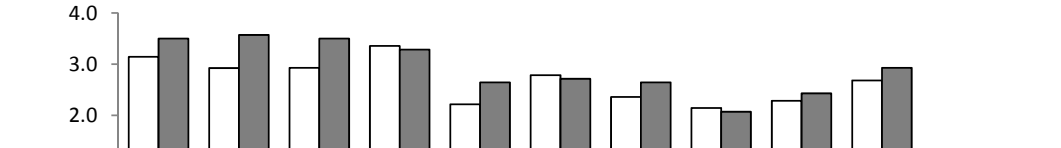
Baseline	4.0	4.0	3.7	3.3	4.0	3.7	4.0	3.3	3.7	3.7
Midline	3.7	3.7	4.0	3.7	4.0	4.0	4.0	3.3	3.7	3.8

7) Facilities Management domain has the following 11 elements:

- Disabled access to all patient areas,
- Clear, coherent signs posted throughout
- Fume cabinets, extractor fans and ventilation systems in place
- Compressed gas cylinders secured and gas stocks securely stored
- Radiation danger signs for women and ionizing radiation monitors for staff in place
- Defibrillators maintained and calibrated
- Emergency generators tested on full load
- Firefighting equipment tested annually and appropriate pictogram fire exit signs
- Cigarette smoking not allowed in hospital
- Waste is segregated and treated appropriately, color-coded waste bags used appropriately
- Waste-handling staff trained and using correct equipment.

There was minimal change in the overall average in this domain (Figure 8). All JCI hospitals showed an increase.

Figure 8. Sumary for Facilities Management in Nine Hospitals by Phase by Group



Facilities Management

	A	B	D	C	E	F	G	H	I	All
Baseline	3.1	2.9	2.9	3.4	2.2	2.8	2.4	2.1	2.3	2.7
Midline	3.5	3.6	3.5	3.3	2.6	2.7	2.6	2.1	2.4	2.9

8) Medication Safety

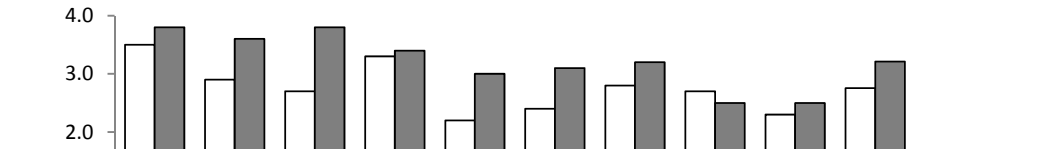
The medication safety domain includes the following criteria:

- There is systematic monitoring and evaluations for addition of new medicines into the hospital formulary
- Hospital policy requires the use of international non-proprietary names, not branded name drugs.
- High-risk medications are not included in floor stocks
- Medication storage areas are regularly checked by pharmacists
- High-Risk infusions are prepared by central pharmacy
- Patients are given written medication information including adverse reactions
- Full information is provided to patients on medication prescriptions
- Patient information is verified and double-checked before administration
- There is adherence to the rule that medications remain in packages until administration

Medication errors and near-misses are reported and the data are used to improve medication safety.

Score for medication safety ranged from 2.2 to 3.5 (mean 2.5) in baseline to 2.5 to 3.8 in midline (mean 3.2) in the midline (Figure 9). Only Hospital H (NHA) did not shown an increase over the period.

Figure 9. Summary for Medication Safety in Nine Hospitals by Phase by Group



Medication Safety

	A	B	D	C	E	F	G	H	I	All
Baseline	3.5	2.9	2.7	3.3	2.2	2.4	2.8	2.7	2.3	2.8
Midline	3.8	3.6	3.8	3.4	3.0	3.1	3.2	2.5	2.5	3.2

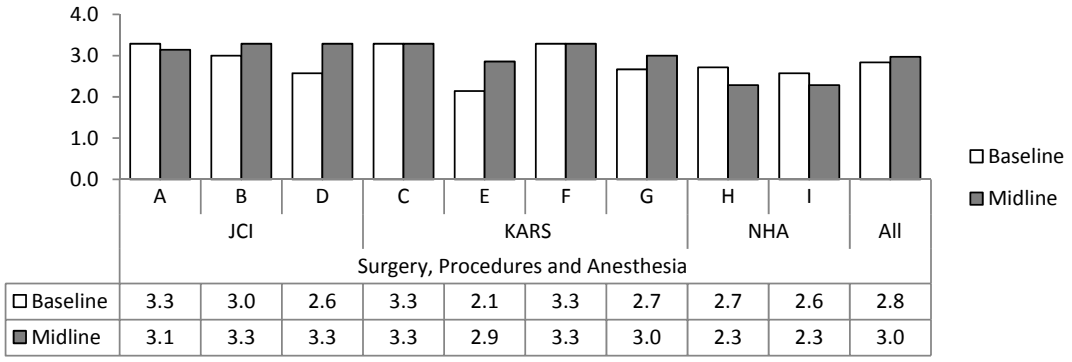
9) Surgery, Procedures and Anesthesia domain consisted of the following criteria:

- Formal guidelines for elective surgery pre-assessment are used to assess patients' readiness for the procedure

- There is routine pre-surgical prophylactic antibiotic administration
- Marking surgical site is conducted with patient's confirmation
- Surgical department's use of the WHO patient safety surgical checklist. Pulse oximetry is routinely used during surgical procedures, surgical records are accurate, complete and signed

The mean difference from baseline to midline was an increase of 0.2 to 3.0 overall (Figure 10). Only hospitals A (JCI) and H and I (NHA) did not shown an improvement.

Figure 10. Summary for Surgery, Procedures and Anesthesia in Nine Hospitals by Phase by Group



Surgery, Procedures and Anesthesia

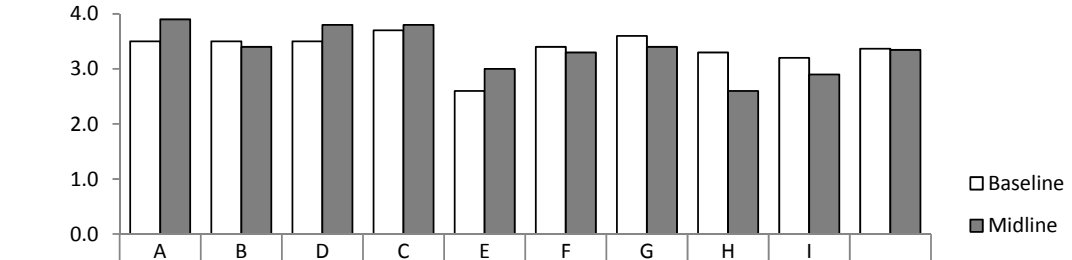
	A	B	D	C	E	F	G	H	I	All
Baseline	3.3	3.0	2.6	3.3	2.1	3.3	2.7	2.7	2.6	2.8
Midline	3.1	3.3	3.3	3.3	2.9	3.3	3.0	2.3	2.3	3.0

10) Documentation and Records domain was comprised of the following criteria:

- There is an approved policy on identification of patients.
- Basic information is available in medical records with only one set of case notes per-patient, case notes have up-to-date identification, and case notes are legible, dated, and signed
- Admission notes are completed before surgical procedures (except in emergencies) and procedures recorded immediately and filed in the medical records appropriately,
- All diagnoses/procedures are recorded two weeks post-discharge with International Classification of Diseases – Tenth Edition (ICD-10) discharge summaries completed
- Case notes are retained according to the national guidelines.

Overall, the documentation and records criteria had decreased from 3.4 to 3.3. Two of three JCI hospitals increased while three KARS hospitals decreased and all NHA hospitals decreased (Figure 11).

Figure 11. Summary for Documentation and Records in Nine Hospitals by Phase by Group



Documentation and Records

	A	B	D	C	E	F	G	H	I	All
Baseline	3.5	3.5	3.5	3.7	2.6	3.4	3.6	3.3	3.2	3.4
Midline	3.9	3.4	3.8	3.8	3	3.3	3.4	2.6	2.9	3.3

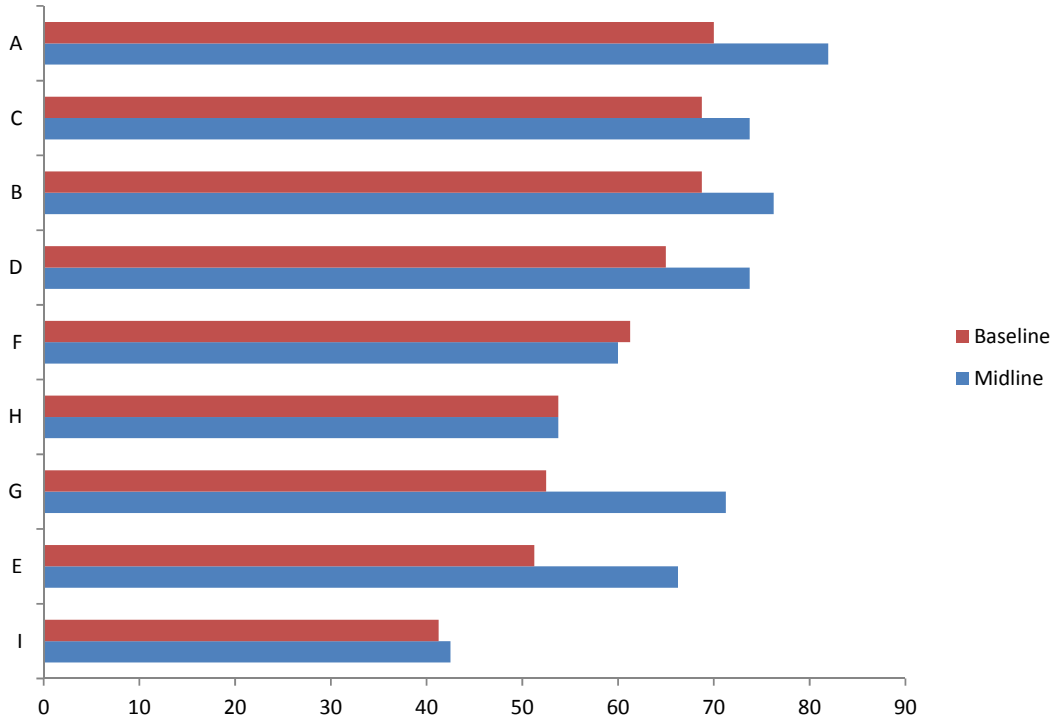
C. Organizational Audit

The Organizational Audit (OA) was based on 10 criteria determined from the four hospital departments, obstetric, pediatric, internal medicine and surgery:

1. Patient information literature available on the unit/ward includes patient versions of national or local guidelines/standards.
2. Manual of policies and procedures to guide nursing care.
3. Clinical review included analysis of reported events adverse to patients.
4. Bracelet ID all patients.
5. Resuscitation equipment is accessible, complete, clearly organised and fully functional.
6. Safety boxes for disposal of injection devices are available in sufficient quantities for the number of injections administered.
7. There is no concentrated potassium chloride (KCl) stored in patient service areas.
8. Diagrammatic instructions for resuscitation are available in resuscitation areas.
9. Evidence-based clinical guidelines have been formally adopted, disseminated and implemented by the clinical staff.
10. Clinical teams meet regularly to evaluate and compare current practice against evidence-based guidelines for this service ("clinical review").

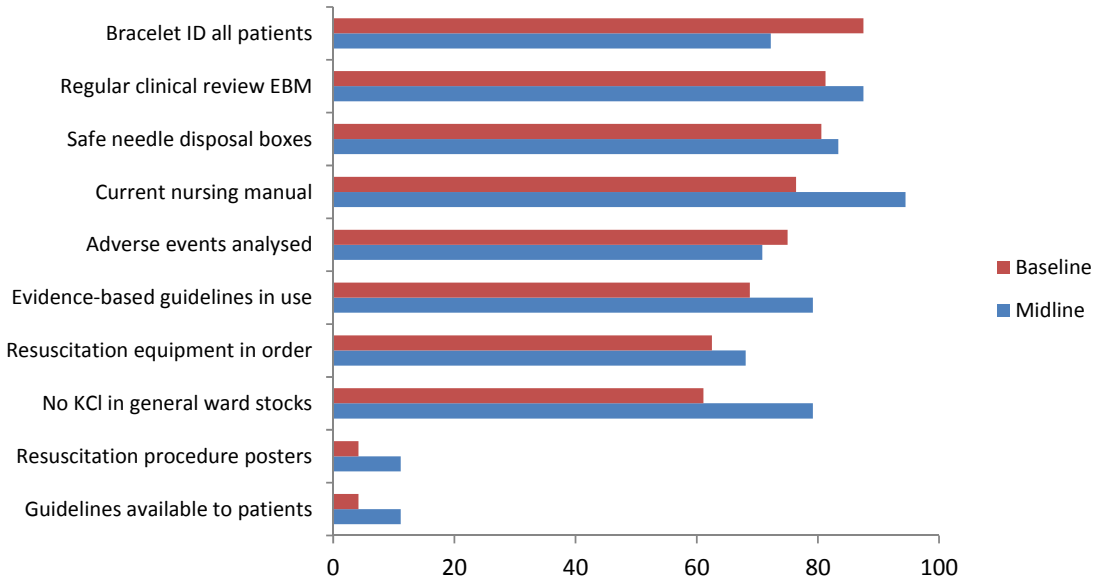
Composite results showed that the majority of hospitals improved from baseline to midline. There were major improvement in Hospitals A, E and G, while Hospital F experienced a slight decrease (Figure 12).

Figure 12. Comparison of Total Scores of 10 Keys OA Criteria between Baseline and Midline by Hospitals



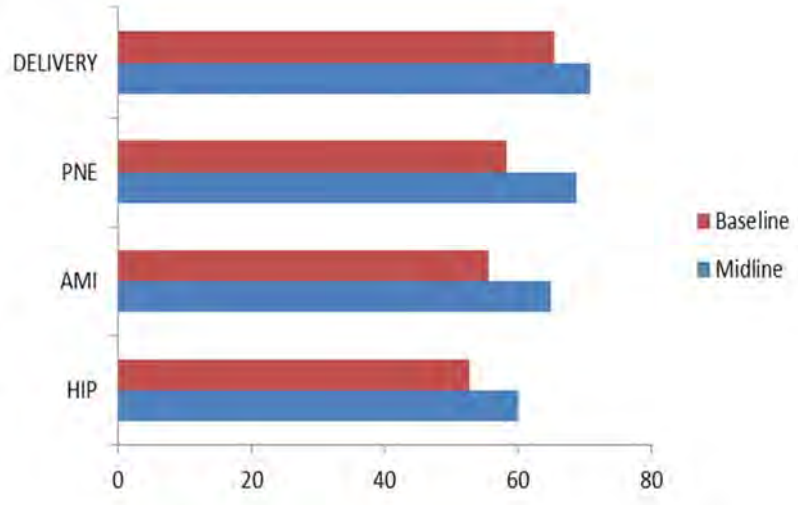
Most criteria in all departments increased in all hospitals except for bracelet IDs for all patients and adverse events analysed (Figure 13). However, the baseline assessment was based on observation during the visit by the data collectors while in the midline, results of the data collection instrument for patient interviews in each department were used. In order to improve the accuracy and validity of the study, the changes were made after the researchers added this question to the midline.

Figure 13. Comparison of Total Scores of 10 Keys OA Criteria between Baseline and Midline in All Hospitals



All departments increased on 10 criteria assessed between baseline and midline periods by about 10% (Figure 14).

Figure 14. Total Scores of 10 Keys OA Criteria between Baseline and Midline by Departments



D. Clinical Chart Review

1. Delivery

Patient characteristics

At baseline, out of pocket (OOP) was the most widely used payment method (35%), but at midline, the proportion using Jampersal was highest (33%) (Table 13). In JCI hospitals, the proportion of OOP payers was higher than the other two hospital categories in both periods while the proportion of Jampersal was decreasing and the proportion using Insurance for the poor increased 50% from baseline to midline. In NHA hospitals, the percentage of Jampersal was highest in baseline and midline period. However, the percentage of insurance for the poor increased 50%, while OOP and government insurance decreased.

Table 13. Methods of Payment for Normal Delivery Patients by Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90		n=120		n=60		n=270	
		(%)		(%)		(%)		(%)	
Method of payment	Out of pocket	47	42	36	18	15	2	35	23
	Commercial insurance	0	0	1	0	0	0	0	0
	Government insurance	9	11	7	3	33	7	13	6
	Insurance for the poor	13	26	30	23	12	43	20	29
	Jampersal	31	19	23	35	40	48	30	33
	Others	0	2	0	0	0	0	0	1
	Do not know	0	0	3	21	0	0	2	9

B = Baseline; M =Midline

No difference on length of stay across hospital groups was seen between with a median of 2 days across all (Table 14).

Table 14. Length of Stay for Normal Delivery Patients By Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90		n=120		n=60		n=270	
Lenght of Stay	Mean	3	3	2	2	2	2	2	2
	Median	2	2	2	2	2	2	2	2
	Maximum	14	12	9	13	10	7	14	14
	Minimum	1	1	1	1	1	1	1	1

B = Baseline; M =Midline

There were no maternal deaths reported in the sampled charts in the nine hospitals (Table 15). There were four neonatal deaths recorded at midline, a non-significant decrease from the five that occurred at baseline.

Table 15. Condition at Discharge of Delivery Patient by Hospital Category

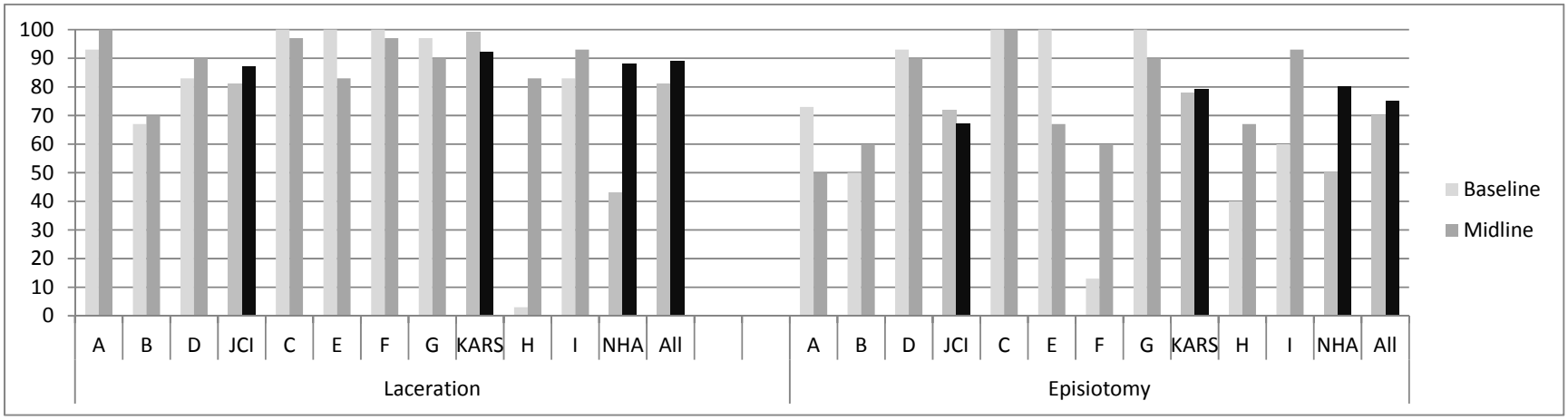
Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90		n=120		n=60		n=270	
		(%)		(%)		(%)		(%)	
Mothers' condition at discharge	Cured/Getting Better	88	97	98	84	68	58	88	83
	Refer to other hospital	0	1	0	2	0	0	0	1
	Death	0	0	0	0	0	0	0	0
	Judicial discharge	0	2	1	3	0	2	0	2
	Others	0	0	0	1	0	0	0	0
	Condition unspecified	12	0	0	0	0	20	4	4
	Unknown	0	0	1	11	33	20	7	9
Children's condition at discharge	Death	1	0	3	3	2	2	2	2
	Reffered	0	0	1	1	0	0	0	0
	Alive	20	0	55	4	5	12	32	4
	Congenital	0	1	0	1	0	0	0	1
	Unknown	79	99	42	92	93	87	66	93

B = Baseline; M =Midlline

Clinical Practice of Delivery by Hospitals

Five hospitals increased their proportion of cases who developed lacerations, including hospitals A, B, D H and I, while hospitals E and G decreased (Figure 15). There is an inverse relationship between the recording of lacerations and episiotomy, especially for hospitals that still use open recording system for delivery reports, increasing the likelihood that course of action not taken are not recorded. By category, NHA hospitals showed large improvements in recording lacerations and episiotomies.

Figure 15. Percentage Laceration and Episiotomy Recorded on Delivery Patient by Hospital and Hospital Category



The medical examination domain consisted of examination of laceration, Apgar score within 5 minutes and birth weight. Overall performance improved from 79% to 87% (Table 16). Those that increased include hospitals A, B, D, H and I while four other hospitals showed decreased.The proportion reporting laceration decreased in hospitals C, E, F and G, most likely because episiotomies had been conducted. Hospitals H experienced an 80% increase in the midline period.

Table 16. Percentage of Medical Examination Recorded in Normal Delivery

Variables	Hospitals and Groups																									
	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Medical examination	80	97	63	60	83	90	76	82	100	93	100	83	100	97	97	90	99	91	3	83	83	93	43	88	79	87
P- Value							0.369										0.063						0.422		0.399	
Laceration	93	100	67	70	83	90	81	87	100	97	100	83	100	97	97	90	99	92	3	83	83	93	43	88	81	89

Variables	Hospitals and Groups																									
	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Apgar score within 5 minutes	100	100	100	90	100	100	100	97	100	100	100	100	100	100	100	100	100	100	97	100	100	100	98	100	100	99
Birth weight	87	97	97	100	100	100	94	99	100	97	100	100	100	100	100	100	100	99	97	100	100	100	98	100	98	99

B = Baseline; M =Midline

In terms of recording of medical examination upon delivery, KARS hospitals decreased by 8% from baseline to midline while NHA hospitals increased recording by (45%) and JCI hospitals by 6%, but changes in all hospital category is not statistically significant (Figures 16 and 17).

Figure 16. Percentage of Medical Examination Recorded on Delivery Patient by Hospital and Hospital Category

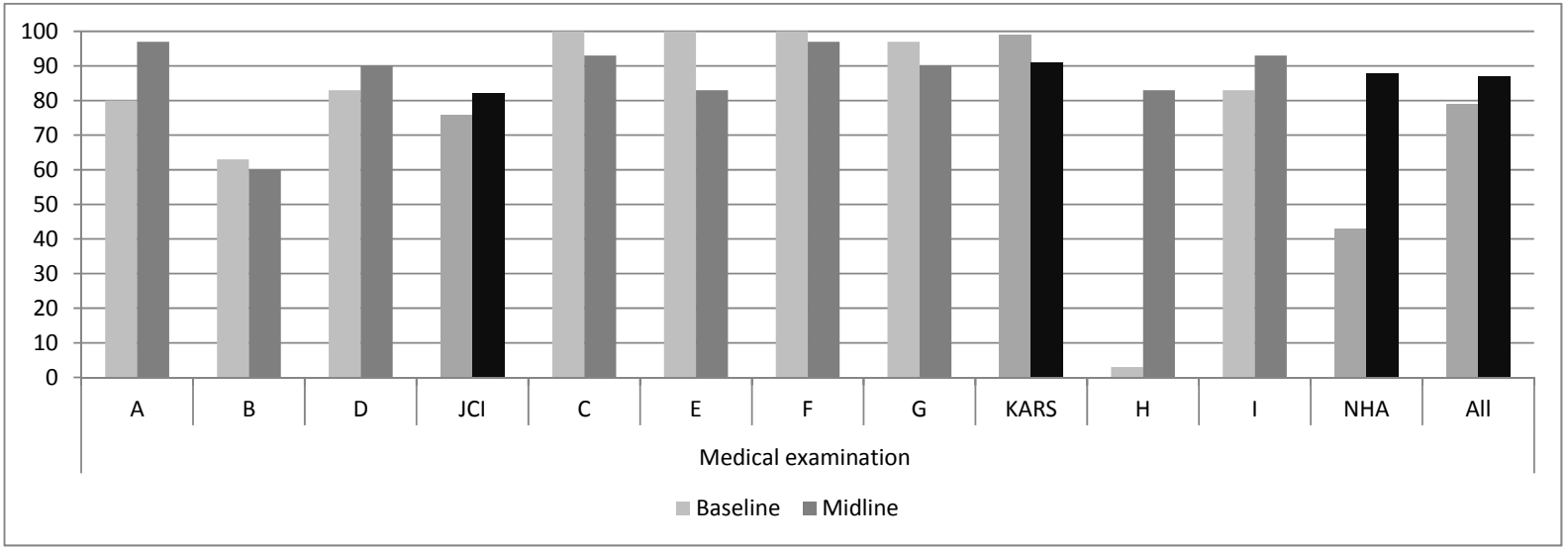
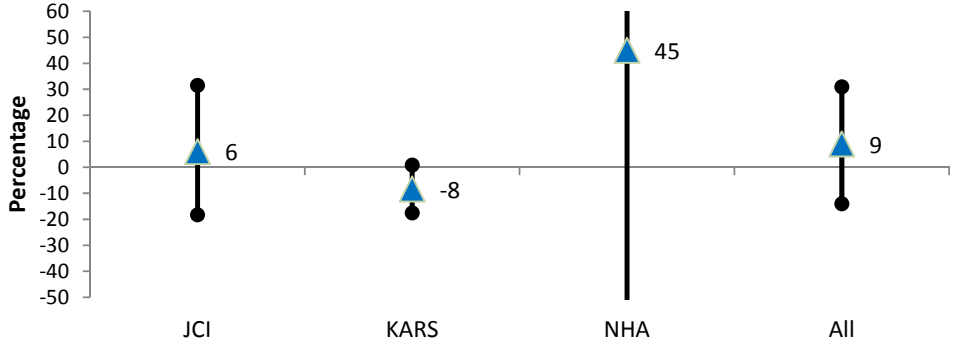


Figure 17. Percentage Difference of Medical Examination Recorded for Delivery by Hospital Category



2. Pneumonia

Pneumonia Patient Characteristics

KARS and JCI hospitals treated slightly younger pneumonia patients in the midline compared to the baseline period (Table 17). Lengths of stay were higher at midline compared to baseline by three days in JCI and NHA hospitals.

Table 17. Percentage of Patient Characteristic at Pneumonia by Hospital Category

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=80	n=90	n=119	n=118	n=52	n=58	n=251	n=266
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Age (month/s)	< 1	2	6	2	29	5	19	3	18
	1 – 11	44	65	63	39	50	48	54	51
	12 – 23	30	15	25	18	20	19	26	17
	24 – 35	12	12	7	10	18	4	11	9

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=80	n=90	n=119	n=118	n=52	n=58	n=251	n=266
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
	36 – 47	9	2	3	3	5	9	6	4
	48 – 59	2	0	0	1	2	2	1	8
	Mean	15	10	11	11	15	11	13	11
	Median	12	6	9	7	10	5	10	6
	Maximum	58	41	39	57	57	56	58	57
	Minimum	1	0	1	0	1	1	1	0
Sex	Male	44	59	52	51	53	54	50	54
	Female	56	41	48	49	47	46	50	46
Lenght of Stay (days)	Mean	7	10	7	8	7	10	7	9
	Median	5	6	5	6	6	7	5	6
	Maximum	93	150	41	60	18	85	93	150
	Minimum	1	1	1	1	1	1	1	1
P-Value		0.002		0.541		0.097		0.012	

B = Baseline; M =Midline

Out-of-pocket payment was still the predominant way hospital bills were paid in the midline as it was at baseline although there was a 10% decrease between the two periods (Table 18). KARS hospitals had more 50% more patients covered under the insurance for the poor compared to the other two hospital groups.

The proportion of charts in which the patient's condition at discharge was recorded increased to 100% in all hospitals (Table 19). The proportion of patients reported to have died increased from 6% to 13% over the period ($p < 0.001$) with all hospital categories contributing to the increase.

Table 18. Method of Payment of Pneumonia Patients by Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90	n=90	n=120	n=120	n=60	n=59	n=270	n=270
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Method of payment	Out of pocket	66	59	58	38	52	58	59	49
	Commercial insurance	2	0	0	0	3	0	2	0
	Government insurance	11	6	8	4	12	12	10	6
	Insurance for the poor	20	34	32	42	27	27	27	36
	Others	1	0	1.7	3	2	2	2	2
	Do not know	0	1.1	1.7	14	5	2	2	7
	P-value	0.093		0.001		0.680		0.001	

B = Baseline; M =Midline

Table 19. Condition at Discharge of Pneumonia Patients by Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90		n=120)		n=60		n=270	
		(%)		(%)		(%)		(%)	
Patient condition at discharge	Cured/Getting Better	67	74	83	68	36	27	67	61
	Refer to other hospital	3	2	0	2	0	0	1	2
	Death	11	18	3	10	3	8	6	13
	Not Cured, judicial discharge	6	3	13	13	28	25	14	12

	Others	0	0	0	3	0	2	0	2
	Discharge, condition unspecified	11	0	0	0	3	0	5	0
	Unknown	2	1	1	4	28	38	7	10
	P-value	0.021		0.014		0.307		0.001	

B = Baseline; M =Midline

Clinical Practice of Pneumonia

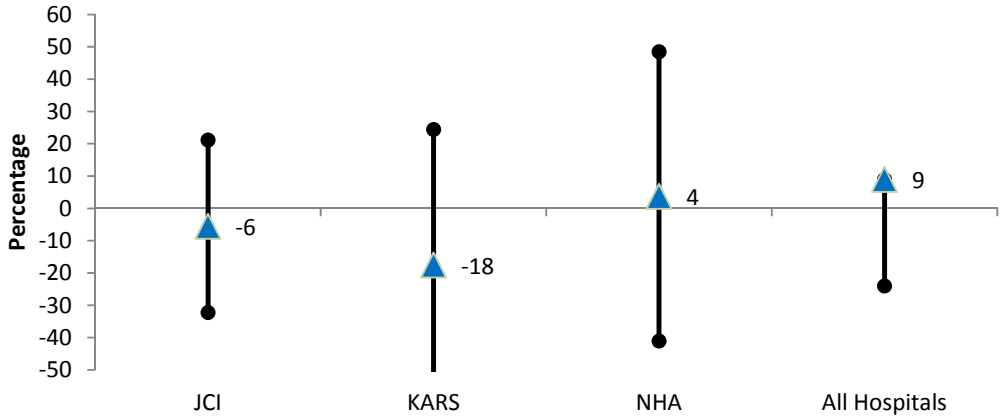
The proportion of charts with medical histories reported for pneumonia patients decreased but not significantly from baseline to midline (Table 20). This composite variable no longer included antibiotic use recording, which was included in the baseline. By hospital, there was no statistically significant difference between the two periods (Figure 18).

Table 20. Percentage of Medical History Recorded at Pneumonia Patients by Hospitals and Hospital Category

Variables	Hospitals and Groups																									
	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Medical History	40	27	40	30	10	17	30	24	60	3	10	10	10	3	7	0	22	4	37	37	3	10	20	24	24	15
P-Value							0.465										0.276						0.482		0.207	
Respiratory symptoms	97	93	100	97	83	93	93	94	97	100	97	97	97	97	97	97	97	98	93	100	93	97	93	98	95	97
Previous asthma	40	30	40	30	10	30	30	30	60	3	13	47	10	13	7	0	23	16	40	53	3	10	22	32	25	24
Immunization	100	87	100	93	100	73	100	84	100	97	100	30	100	40	100	33	100	50	100	73	100	93	100	83	100	69

B = Baseline; M =Midlline

Figure 18. Percentage Difference of Medical History Recorded for Pneumonia Patients by Hospital Category



There was no substantial change in the proportion of charts that had a full record of the basic clinical examination of pneumonia patients - close to full compliance (Figure 19). There was no difference between the three hospital groups (Table 21).

Figure 19. Percentage Difference Physical Examinations Recorded for Pneumonia by Hospital Category

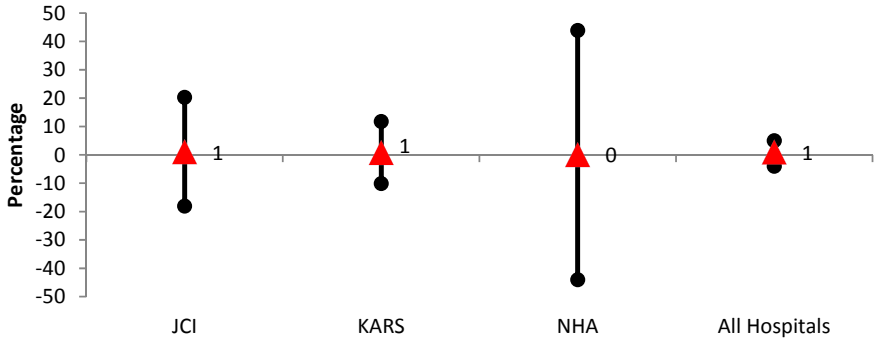


Table 21. Percentage of Physical Examinations Recorded of Pneumonia Patients by Hospitals

Variables	Hospitals and Groups																							
	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Information of Basic Physical Examination	73	83	97	93	97	93	89	90	100	100	100	100	90	100	100	93	98	98	97	100	97	93	97	97	94	95
P-Value							0.826										0.824						0.990		0.726	
Temperature	80	93	97	93	97	93	91	93	100	100	100	100	100	100	100	97	100	99	100	100	97	97	98	98	97	97
Respiratory Rate	97	93	100	100	100	97	99	97	100	100	100	100	97	100	100	97	99	99	97	100	100	100	98	100	99	99
Pulse	93	93	100	100	97	97	97	97	100	100	100	100	90	100	100	100	98	100	100	100	97	97	98	98	97	99

B = Baseline; M =Midlline

3. Acute Myocardial Infarction (AMI)

Patient Characteristics

There was no difference in the average age of patients with AMI between the baseline period and the midline in all categories of hospitals (Table 22). Lengths of stay decreased by an average of 2 days overall (p = 0.153).

Table 22. Age and Length of Stay of AMI Patients by Hospital Category

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90	n=90	n=120	n=119	n=60	n=64	n=270	n=273
Age	Mean	60	59	60	60	57	58	58	58
	Median	60	59	57	58	56	57	57	58
	Maximum	93	83	87	87	84	83	93	87
	Minimum	28	31	34	20	37	33	28	20
		n=74	n=90	n=105	n=109	n=55	n=63	n=234	n=262

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90	n=90	n=120	n=119	n=60	n=64	n=270	n=273
Lenght of Stay	Mean	8	7	8	7	9	7	9	7
	Median	7	6	7	7	7	7	7	6
	Maximum	35	30	135	40	72	14	135	40
	Minimum	1	1	1	1	1	1	1	1
	P-value	0.050		0.741		0.385		0.153	

B = Baseline; M =Midline

Most AMI patients were using government insurance in the baseline while more were using OOP (33%) and insurance for the poor (33%) in the midline (Table 23).

Table 23. Characteristic of AMI Patients (Method of Payment) by Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90	n=90	n=120	n=119	n=60	n=64	n=270	n=273
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Method of payment (insurance)	Out of pocket	39	37	37	24	33	42	37	33
	Commercial	3	0	0	1	0	0	1	0
	Government	36	33	42	24	37	28	39	28
	Insurance for poor	21	29	17	37	30	30	21	33
	Others	0	1	0	0	0	0	0	0
	Do not know	1	0	5	13	0	0	3	6

B = Baseline; M =Midline

There were no large changes in condition at discharge reported or the proportion of charts of AMI patients that had no record for condition at discharge (Table 24). There was a decrease in charts reporting improvement at discharge by 10% in KARS hospitals.

Table 24. AMI Patients' Condition of Discharge by Hospital Category

Variable		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=90	n=90	n=120	n=119	n=60	n=64	n=270	n=273
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Condition of discharge	Cured	26	2	37	6	7	3	26	4
	Referred out	0	0	0	0	0	0	0	0
	Death	16	14	12	12	0	8	10	12
	Judicial Discharge	10	8	14	4	10	9	12	7
	Other	0	0	0	2	5	3	1	2
	Getting better	32	76	33	53	47	56	36	61
	Condition Unspecified	13	0	0	13	10	8	7	8
	Unknown	3	0	4	10	22	13	8	7

B = Baseline; M =Midlline

Clinical Practice of AMI

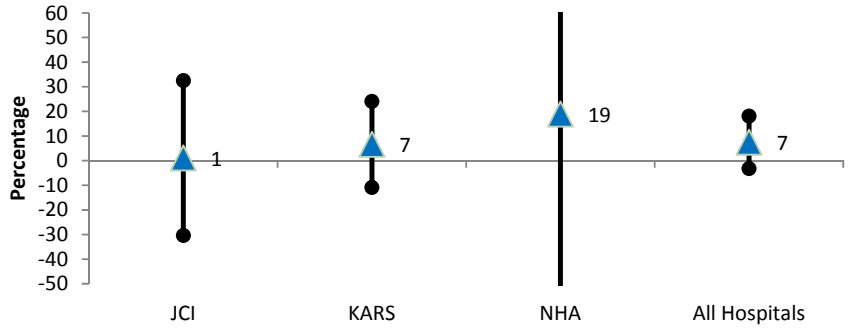
Analysis used in the midline was only cardiac enzymes and EGC for primary diagnosis of AMI, while cholesterol, triglycerides, and LDL were predisposing factors. Hospitals generally increased by an insignificant margin (Table 25). By hospital category, there was also no differences between baseline and endline (Figure 20).

Table 25. Percentage of Clinical Examination Recorded in AMI Patients by Hospitals and Hospital Category

Variables	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Clinical Examination	93	100	83	93	100	87	92	93	80	100	83	90	100	93	93	100	89	96	93	97	50	85	72	91	86	94
P-value							0.893										0.314						0.448		0.144	
Cardiac enzyms examinations	97	100	83	93	100	87	93	93	80	100	90	90	100	97	93	100	91	97	93	97	83	85	88	91	91	94
ECG	97	100	100	100	100	100	99	100	90	100	90	97	100	97	97	100	94	98	100	100	67	100	83	100	93	99

B = Baseline; M =Midlline

Figure 20. Percentage Difference of Clinical Examination Recorded in AMI Patients by Hospital Category



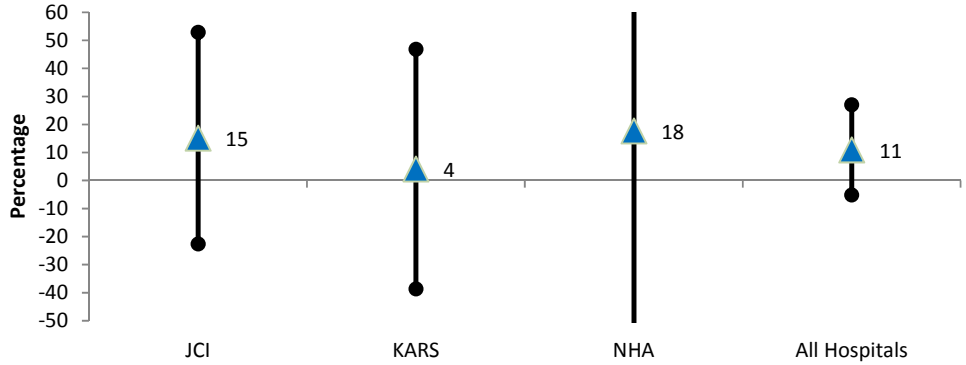
There was a slight overall improvement in medications recorded at discharge from 36 to 47% (p = 0.156) (Table 26). There was no apparent difference between the three hospitals groups in the improvement seen (Figure 21).

Table 26. Percentage of Medication at Discharge Recorded in AMI Patients by Hospitals and Hospital Category

Variables	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Medication at Discharge	19	16	58	79	31	57	36	51	59	60	4	13	46	19	13	54	31	35	60	64	30	62	45	63	36	47
P-value							0.227										0.780						0.425		0.156	
Discharge on oral beta adrenergic blocker	23	20	71	79	42	64	45	55	63	72	14	17	57	27	13	58	38	42	63	64	47	77	55	71	44	53
Discharge on statin	92	80	88	96	54	86	78	87	89	84	21	37	71	65	83	92	65	68	83	88	70	82	77	85	72	78
Discharge on aspirin/ antiplatelet agents	89	76	100	96	62	96	83	90	100	92	43	87	79	77	78	96	75	88	90	92	83	97	87	95	80	90

B = Baseline; M =Midline

Figure 21. Percentage Difference of Medication at Discharge Recorded by Hospital Category



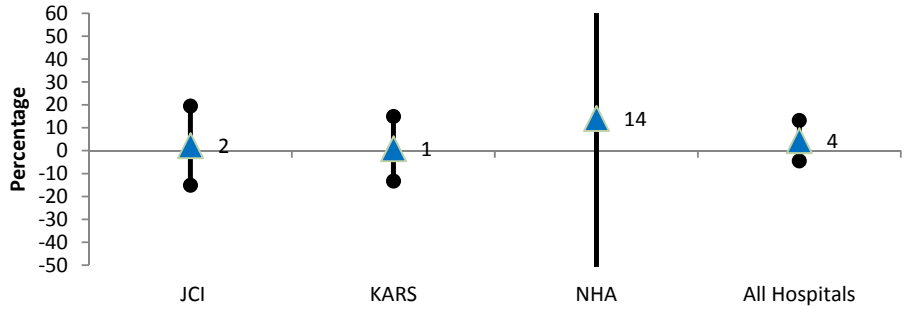
Completeness of reporting of medical history increased a non-significant degree and overall the number remained low at 6% (p = 0.287) (Table 27). Baseline analysis included asthma and COPD but midline data do not because only conditions related directly to AMI were considered. Six of nine hospitals did not improve recording patient history but hospitals H (30%), F (14%) and D (10%) did improve. Considering hospital categories, there were no changes in the proportion of AMI patient charts with their medical histories recorded (Figure 22).

Table 27. Percentage Medical History Recorded in AMI Patients by Hospitals and Hospital Category

Variables	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
Medical History	3	3	3	0	0	10	2	4	7	0	3	0	0	14	0	0	3	3	0	30	0	0	0	14	2	6
p-Value							0.636										0.859						0.521		0.287	
Previous AMI	37	20	23	23	23	50	28	31	50	13	23	33	27	55	10	37	28	35	0	37	0	27	0	31	22	33
Previous Angina Pectoris	33	17	30	27	27	67	30	37	87	13	23	33	43	69	23	53	44	42	0	63	3	27	2	44	30	41
Hypertension	100	100	100	97	97	100	99	99	100	93	90	93	100	97	70	100	90	96	93	100	33	100	63	100	87	98
Hypercholesterolaemia	77	87	60	73	87	63	74	74	60	63	77	43	80	79	40	70	64	64	73	93	10	79	42	86	63	73
Cerebrovascular disease	20	43	7	10	10	53	12	36	23	30	3	3	23	24	0	10	13	17	17	100	7	6	12	50	12	31
Previous Heart failure	37	40	10	0	23	47	23	29	67	17	7	10	57	59	23	57	38	35	0	83	7	35	3	58	26	38
Diabetic	93	93	67	87	87	97	82	92	87	87	60	73	97	97	40	93	71	87	37	100	20	65	28	81	65	88

B = Baseline; M =Midline

Figure 22. Percentage Difference of Medical History Recorded for AMI by Hospital Category



4. Hip Fracture

Patient Characteristics

There was an increase in the mean age of patients admitted for hip fracture from all hospitals from 49 years old at baseline and 60 years old at midline (Table 28). Average lengths of stay across all hospitals were unchanged at a mean of 15 days.

Table 28. Age and Length of Stay of Hip Fracture Patients by Hospital Category

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=80	n=90	n=35	n=106	n=30	n=39	n=145	n=235
Age	Mean	54	60	40	59	46	60	49	60
	Median	63	65	32	65	43	62	48	65
	Maximum	92	92	89	89	87	85	92	92
	Minimum	2	13	1	17	9	20	1	13
		n=76	n=90	n=35	n=102	n=18	n=35	n=129	n=227
Length of Stay	Mean	15	14	15	17	13	13	15	15
	Median	11	12	13	12	14	10	12	11
	Maximum	95	47	55	76	36	41	95	76
	Minimum	1	2	1	1	1	1	1	1
	p-value	0.738		0.919		0.652		0.873	

B = Baseline; M =Midline

The payment methods most often used at midline were government insurance and OOP (Table 29). Government insurance payment in KARS hospitals was (35%) and in NHA hospitals is (41%) while in JCI hospitals, OOP is still the most widely used payment method, although the percentage decreased compared to the baseline (15%; p = 0.001). There was no change in condition at discharge.

Table 29. Method of Payment of Hip Fracture Patients by Hospital Category

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=80	n=90	n=35	n=106	n=30	n=39	n=145	n=235
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Method of payment	Out of pocket	54	39	51	20	50	41	52	31
	Commercial insurance	0	0	0	0	0	0	0	0
	Government insurance	26	34	17	35	27	41	24	36
	Insurance for the poor	20	27	20	29	13	15	19	26
	Others	0	0	3	0	3	0	1	0
	Do not know	0	0	9	16	7	3	3	8
	P-value	0.152		0.002		0.507		0.001	
Patient condition at discharge	Cured	70	95	63	46	40	46	62	65
	Referred out	0	0	0	0	0	0	0	0
	Death	4	1	0	3	7	0	3	2
	Judicial Discharge	14	4	34	25	37	36	24	19
	Other	0	0	0	20	3	8	1	10
	Condition unspecified	0	0	0	0	0	0	0	0
	Unknown	12	0	3	6	13	10	10	4
	P-value	0.001		0.027		0.486		0.001	

B = Baseline; M =Midline

Clinical Practice

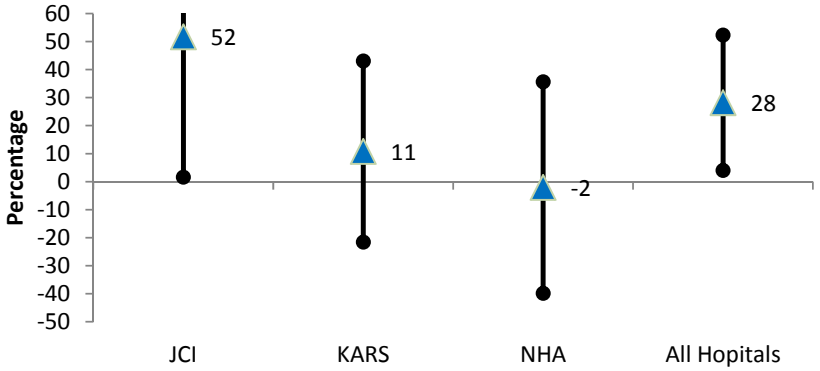
The standard intervention consist ofproportion of surgery and receiving antibiotic prophylaxis. Most hospitals increased prophylactic antibiotic use from baseline to midline (mean 28%: p = 0.027), while a major decline occurred only in Hospitals F (20%) (Table 30). JCI hospitals has the most substantial increase at 52% (p= 0.047) (Figure 23). Not all hospitals have guideline on antibiotic prophylactic, including hospitals accredited, by JCI but all hospitals generally do this prior to surgery.

Table 30. Percentage of Standard Interventionfor Hip Fracture Patients

Variables	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
	n=20	n=30	n=30	n=30	n=30	n=30	n=80	n=90	n=8	n=30	n=6	n=16	n=5	n=30	n=16	n=30	n=35	n=106	n=23	n=29	n=7	n=10	n=30	n=39	n=145	n=235
Standard	35	77	23	97	47	87	35	87	50	63	33	88	80	67	63	63	57	68	65	66	14	10	53	51	44	72
P-value							0.047										0.366						0.615		0.027	
Surgery	35	83	73	97	53	90	56	90	88	63	67	94	80	83	75	67	77	75	74	66	57	20	70	54	64	77
Antibiotic prophylactic	100	92	32	100	88	96	62	96	57	100	50	93	100	80	83	95	74	91	88	100	25	50	76	95	69	94

B = Baseline; M =Midline

Figure 23. Difference of Clinical Examination (Prop Yes) for HIP Fracture by Hospital Category



Not all hospitals provide thromboembolic prophylaxis for patients who underwent surgery. In hospitals E and G, no thromboembolic prophylaxis was recorded for patients at baseline or midline. Hospitals A, B, D, H and I recorded increases in thromboembolic prophylaxis from baseline to midline of between 7% -50% (Table 31). In JCI hospitals, the increase was 23% while in NHA hospitals it was 14% and in KARS hospitals there was no change.

Table 31. Percentage of Mobilization and Treatment Received of Hip Fracture Patients by Hospitals and Hospital Category

Variables	A		B		D		JCI		C		E		F		G		KARS		H		I		NHA		Total	
	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
	n=20	n=30	n=30	n=30	n=30	n=30	n=80	n=90	n=8	n=30	n=6	n=16	n=5	n=30	n=16	n=30	n=35	n=106	n=23	n=29	n=7	n=10	n=30	n=39	n=145	n=235
Mobilisation post-surgery	100	100	45	69	75	100	64	89	57	37	25	53	75	80	0	80	30	65	35	68	0	50	29	67	46	76
Thromboembolic therapy	14	48	0	7	6	30	4	27	14	11	0	0	25	7	0	0	7	5	0	11	0	50	0	14	4	16

B = Baseline; M =Midline

E. Patient Interview

Characteristics of Respondents

More than 70% of patient interview respondents were women across all hospitals at both baseline and endline. Most were high school graduates and most were above 40 age years of age with no significant difference between the two periods (Table 32).

Table 32. Characteristics of Respondents by Hospital Category

Variables		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
		n=366	n=360	n=480	n=486	n=234	n=241	n=1080	n=1087
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Sex	Male	27	24	28	29	29	29	28	27
	Female	73	76	72	71	71	71	72	73
Education	None and primary school	24	23	34	25	21	17	28	23
	High school	62	60	53	58	59	66	57	60
	Academy and University	14	17	13	17	20	17	15	17
Age Categories	<= 20 years	6	4	7	3	5	7	6	5
	21 - 30 years	25	28	27	26	27	32	26	28
	31 - 40 years	28	26	30	32	30	23	29	28
	> 40 years	40	41	37	38	38	38	38	39
	Mean	39	38	38	39	39	38	39	39
	Minimum	17	18	17	18	15	18	15	18
	Maximum	81	75	79	79	87	85	87	85

B = Baseline; M =Midline

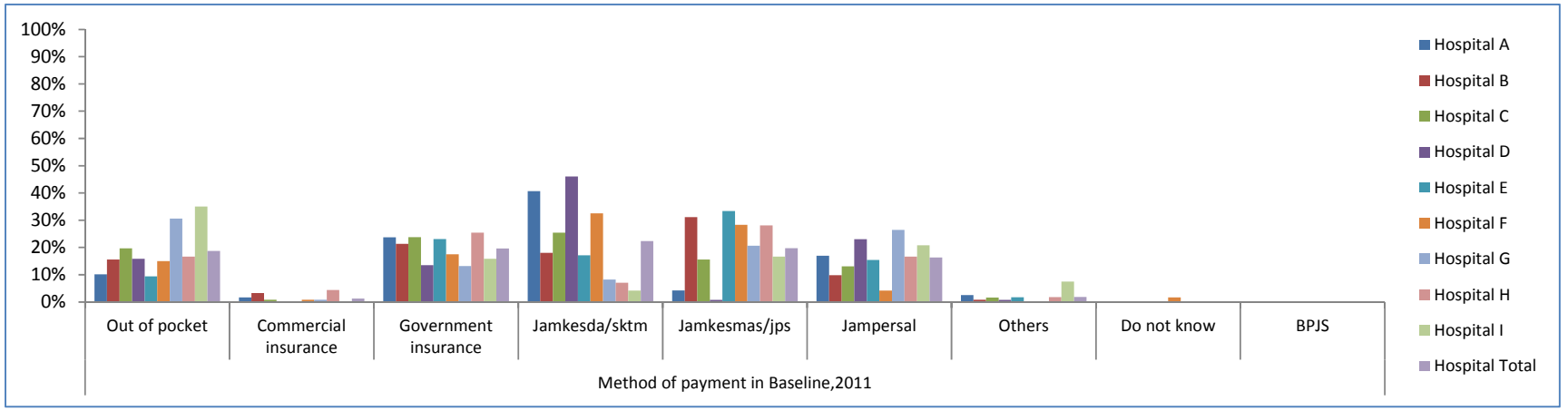
Clearly the biggest change between the baseline and midline in the implementation of JKN and the consequent shift of all patients from Jampersal, Jamkesmas, government insurance over to BPJS (Table 33 and Figure 24). There was also a decrease in those using OOP, commercial and other types of insurance over the period.

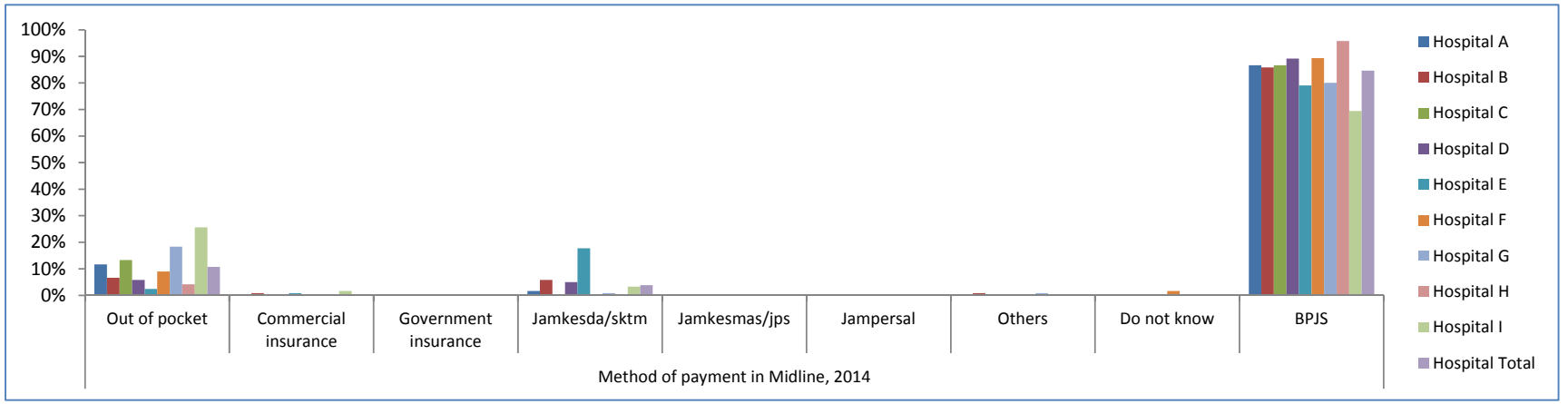
Table 33. Percentage Method of Payment by Phase by Hospital

Variable		A		B		C		D		E		F		G		H		I		Total	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	n=120	n=122	n=120	n=126	n=120	n=117	n=124	n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=1080	n=1087
Method of payment	Out of pocket	10	12	16	7	20	13	16	6	9	2	15	9	31	18	17	4	35	26	19	11
	Commercial	2	0	3	1	1	0	0	0	0	1	1	0	1	0	4	0	0	2	1	0
	Government	24	0	21	0	24	0	13	0	23	0	18	0	13	0	25	0	16	0	20	0
	Jamkesda/sktm	41	2	18	6	25	0	46	5	17	18	33	0	8	1	7	0	4	3	22	4
	Jamkesmas	4	0	31	0	16	0	1	0	33	0	28	0	21	0	28	0	17	0	20	0
	Jampersal	17	0	10	0	13	0	23	0	15	0	4	0	26	0	17	0	21	0	16	0
	Others	3	0	1	1	2	0	1	0	2	0	0	0	0	1	2	0	8	0	2	0
	Do not know	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
	BPJS	0	87	0	86	0	87	0	89	0	79	0	89	0	80	0	96	0	69	0	85

B = Baseline; M =Midline

Figure 24. Method of Payment by Phase by Hospital





The length of stay in most hospital categories at each department decreased in the midline, especially in JCI hospitals (Table 34). In KARS hospitals in pediatric departments, there was a slightly increase from baseline to midline (from 5 to 6 days).

Table 34. Length of Stay (Days) of Patients Experience by Hospital Category

Variables		Hospital Category							
		JCI		KARS		NHA		Total	
		B	M	B	M	B	M	B	M
Obstetric	mean	6	4	4	4	4	4	4	4
	P value	0.001		0.338		0.341		0.333	
Pediatric	mean	11	8	7	8	7	6	9	8
	P value	0.011		0.455		0.628		0.188	
Internal Medicine	mean	11	7	10	9	8	7	10	8
	P value	0.103		0.747		0.273		0.113	
Surgery	mean	13	8	12	11	14	10	13	10
	P value	0.004		0.295		0.287		0.004	

B = Baseline; M =Midlline

Patient Perception of Medical Services

In Hospitals C and D there was an increase inpatient perception of medical services but in all seven others there was a decreased (Table 35). Most respondents stated that the medical doctor provided clear explanations and most think the doctors were competent. However, this decreased in Hospitals B, E, F and G.

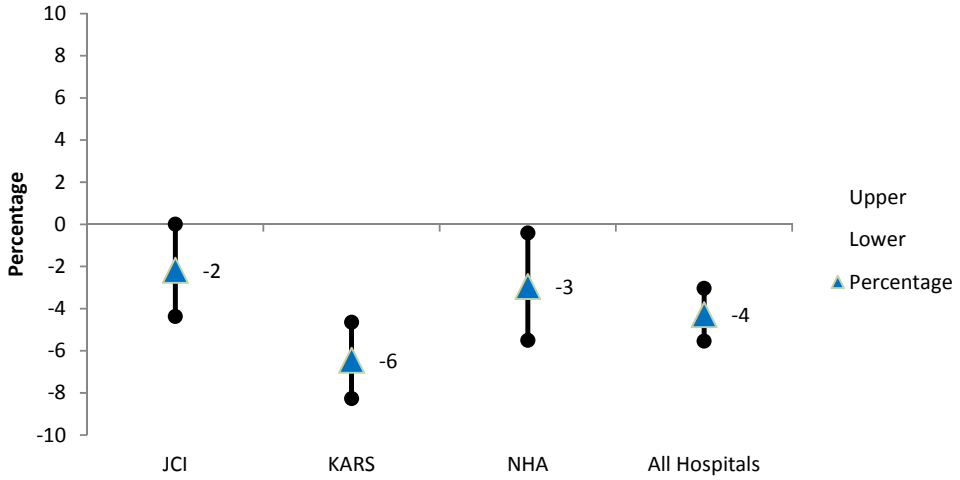
Table 35. Percentage of Patient Experiences on Medical Services by Hospitals

Variables		A		B*		C		D		E*		F*		G*		H		I		Total*	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=117	n=124	n=120	n=122	n=121	n=120	n=114	n=120	n=120	n=121	n=1080	n=1087
Favorable Perception on Medical Services	Percentage difference	-3		-6		2		2		-9		-6		-14		-3		-3		-4	
	Upper	1		-2		5		6		-5		-2		-10		1		1		-3	
	Lower	-7		-9		-1		-2		-12		-9		-19		-7		-6		6	
Doctor talks clearly	Not clear	2	0	2	0	4	0	2	2	0	1	2	0	1	3	4	4	2	1	2	1
	Rather clear	19	16	12	3	11	3	11	8	7	4	4	7	7	16	14	16	15	20	11	10
	Clear	57	69	49	85	77	86	68	73	68	81	71	79	37	62	68	71	76	79	63	76
	Very clear	23	15	37	13	8	11	19	18	25	14	23	15	55	20	14	9	8	1	24	13
Confidence in doctors' professional competence	Not confidence	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	1	0	0	1
	Rather confidence	2	3	4	0	4	2	10	2	1	2	1	2	2	16	7	10	8	4	4	5
	Confidence	74	89	50	80	84	93	72	78	45	84	64	82	60	71	80	78	80	95	68	83
	Very confidence	25	8	46	20	12	5	18	20	54	14	35	14	37	13	13	9	12	1	28	12

B = Baseline; M =Midline *****statistically significant ($p \leq 0.05$)

Patient experience on medical service was a composite variable of communication of medical doctor and perception of medical competency of the doctor. There was a decrease from baseline to midline in all categories with hospitals KARS experiencing the greatest decline (Figure 25).

Figure 25. Percentage Difference between Baseline and Midline Study of Favorable Patient Experiences toward Medical Services by Hospital Category



Patient Experience with Nursing Services

In Hospitals E, F, G, H, and I the proportion of patients with favorable perceptions of nursing care decreased while only Hospital C increased (Table 36). By hospital category, JCI hospitals experienced about half the decrease in overall perception of the nursing staff as the other two categories (Figure 26).

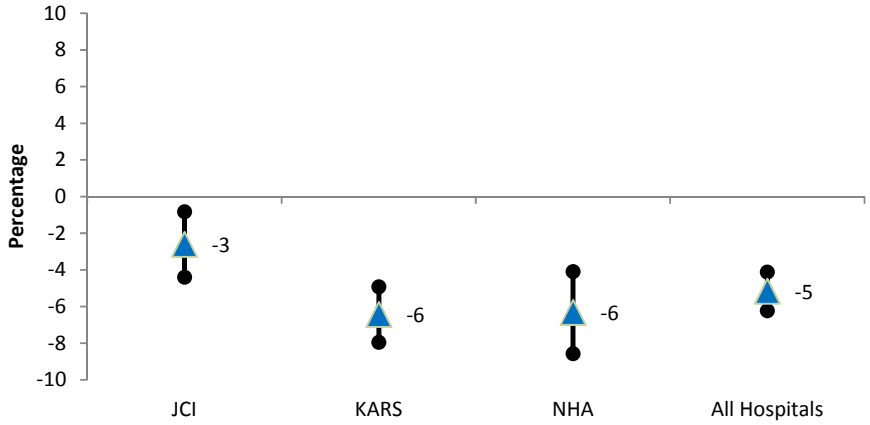
Table 36. Percentage of Patient Experience on Nursing Services by Hospitals

Variables		A		B		C		D		E*		F*		G*		H*		I*		Total*	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	n=120	n=122	n=120	n=126	n=120	n=117	n=124	n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=1080	n=1087
Favorable perception of nursing services	Percentage difference	-3		-3		2		-2		-9		-6		-13		-8		-5		-5	
	Upper	0		0		4		1		-7		-3		-9		-5		-5		-4	
	Lower	-6		-6		-1		-5		-12		-9		-16		-12		-7		-6	
Confidence in the professional competence	Not	1	0	1	0	1	0	1	0	0	0	2	0	2	1	2	2	0	0	1	0
	Somewhat	7	10	11	1	20	5	13	0	3	6	6	5	7	9	18	25	8	7	10	8
	Confident	84	86	63	93	74	94	78	93	68	86	79	88	57	83	75	72	87	92	74	87
	Very	8	4	25	7	5	1	9	7	29	8	13	7	33	8	5	2	5	1	15	5
How staff care for patients	Not good	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0
	Fair	15	4	9	2	12	3	12	1	3	6	11	3	5	20	13	25	10	14	10	9
	Good	64	87	57	85	74	92	70	82	72	81	68	82	63	61	73	67	80	84	69	80
	Very good	19	9	33	13	13	6	18	18	25	14	22	15	32	19	13	7	9	2	21	11
Attentiveness to patient	Not	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	1	0	1
	A little care	10	7	7	3	11	3	8	2	3	4	3	4	10	24	8	16	14	7	8	8
	Moderately	60	83	63	81	71	93	67	79	68	84	54	84	53	58	80	74	71	92	65	81
	Very	30	9	30	17	17	5	25	19	29	12	43	12	37	18	11	8	12	1	26	11
Information on tests & examinations	None	2	3	2	0	5	0	1	0	0	0	0	3	4	18	4	8	16	1	4	3
	Fair	14	18	17	8	25	4	10	6	3	12	2	6	7	28	9	17	26	47	13	16
	Good	53	64	52	73	62	82	52	60	68	76	85	76	45	42	63	64	52	52	59	65
	Very good	31	16	29	19	8	14	37	34	29	12	13	15	44	13	25	12	7	0	25	15
Satisfaction	Not	3	1	1	0	0	0	2	1	1	0	1	0	2	3	1	1	1	1	1	1
	Fair	15	11	7	5	11	13	17	5	6	5	6	5	12	27	16	37	18	17	12	14
	Good	69	81	62	81	80	83	60	78	77	82	64	84	65	60	69	58	68	82	68	77
	Very good	14	8	30	14	10	3	21	16	16	13	29	11	21	11	14	4	13	0	19	9
Timely manner	Never	1	1	2	1	4	1	2	1	0	0	0	2	1	0	2	1	2	0	1	1
	Seldom	19	13	10	3	32	8	7	6	3	4	5	4	3	15	9	13	7	7	11	8
	Often	30	31	56	79	37	75	26	75	19	43	38	56	33	53	48	63	53	91	38	63

Variables		A		B		C		D		E*		F*		G*		H*		I*		Total*	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	n=120	n=122	n=120	n=126	n=120	n=117	n=124	n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=1080	n=1087
	Always	50	55	33	18	27	17	65	18	78	53	58	39	63	33	41	24	39	2	50	29
Provide good service to patients	Never	0	1	0	0	1	0	0	0	0	0	0	1	0	2	2	0	0	0	0	0
	Seldom	14	5	6	3	18	3	7	1	0	3	5	4	3	6	7	20	8	11	8	6
	Often	40	85	52	80	39	94	38	83	9	89	39	82	44	74	51	78	53	88	41	84
	Always	47	9	42	18	42	3	55	17	91	8	56	13	53	18	40	3	38	2	51	10

B = Baseline; M =Midlline *****statistically significant ($p \leq 0.05$)

Figure 26. Percentage Difference between Baseline and Midline Study of Favorable Patient Experiences toward the Nursing Care by Hospital Category



Patient Perceptions of Medical Decisions and Discharge Instructions

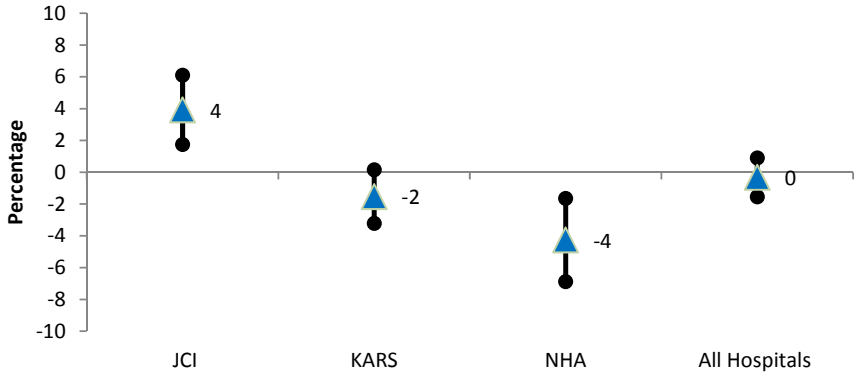
In Hospitals C, D, E, F, G and H, the proportion of patients with favorable perceptions of medical decision-making and discharge instructions decreased from baseline to midline (Table 37). By category, JCI hospitals showed an improvement while KARS hospitals had a slight decrease and NHA hospitals had a greater decrease (Figure 27).

Table 37. Percentage Change from Baseline to Midline in Patient Perceptions on Medical Decision and Discharge Explanation

Variables		A		B		C*		D*		E*		F*		G*		H*		I		Total	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	n=120	n=122	n=120	n=126	n=120	n=117	n=124	n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=1080	n=1087
Patient Satisfaction	Percentage	2		3		11		7		-3		-6		-9		-9		0		0	
	Upper	6		7		14		11		0		-3		-5		-5		3		1	
	Lower	-2		-1		8		4		-6		-8		-12		-12		-4		-2	
Patient involved in decisions	No	5	1	2	0	7	0	17	1	0	1	0	1	3	5	3	3	13	3	6	2
	A little	8	5	13	0	17	0	18	1	1	5	1	2	7	18	10	8	16	17	10	6
	Involved	67	82	50	74	65	94	60	93	47	82	68	89	61	66	64	82	69	79	61	82
	Very	20	13	34	26	11	6	5	5	52	12	31	9	29	11	24	8	3	0	23	10
Clear discharge instructions	No	1	8	1	1	11	1	0	0	0	0	3	1	1	1	3	5	5	2	3	2
	Little	27	7	15	0	35	0	9	6	3	3	2	2	2	11	10	29	31	39	15	11
	Yes - clear	49	70	52	89	43	93	67	83	63	79	82	80	56	74	55	61	58	60	58	77
	Very clear	23	16	33	10	11	6	25	11	34	18	13	17	40	14	32	5	6	0	24	11
Recommend hospital	No	8	5	5	3	2	2	7	7	9	5	1	7	2	4	5	2	1	2	4	4
	Probably	19	9	42	8	33	3	33	3	23	5	6	3	8	18	19	29	18	15	23	10
	Yes	60	78	33	81	54	93	44	79	61	77	59	83	82	67	62	64	69	83	58	78
	Absolutely	13	8	20	8	11	3	16	11	7	13	34	7	8	12	13	5	12	1	15	7

B = Baseline; M =Midline *****statiestically significant ($p \leq 0.05$)

Figure 27. Percentage Favorable Perception of Medical Decision-making and Clarity of Discharge Instruction by Hospital Category



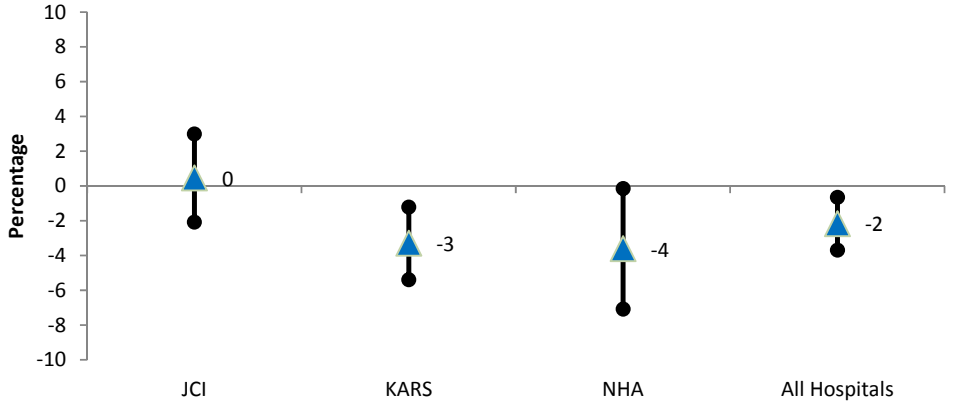
In all hospitals, the perception of patient of the hospital facilities decreased around 2% between baseline and midline (Table38). By hospital category, JCI hospitals were essentially unchanged while the other two hospital categories decreased by about the same proportion (Figure 28).

Table 38. Percentage Difference between Baseline and Midline in Favorable Perception of Patients toward Hospital Facilities

Variable		A		B		C		D		E		F*		G		H*		I		Total*	
		B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M	B	M
		n=118	n=120	n=122	n=120	n=122	n=120	n=126	n=120	n=117	n=124	n=118	n=120	n=122	120	n=122	n=120	n=126	n=120	n=1080	n=1087
Facilities appropriate	Percentage	-4		3		0		2		0		-10		-4		-9		2		-2	
	Upper	0		8		4		7		-3		-5		1		-4		6		-1	
	Lower	-8		-1		-3		-2		4		-14		-9		-14		-3		-4	
	Not at all	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	2	2	0	1	0
	Somewhat	14	20	13	5	14	6	18	8	15	8	11	15	16	24	23	40	39	36	18	18
	Proper	75	74	68	78	75	93	66	80	74	88	63	80	69	64	62	56	58	63	68	75
	Very	12	6	18	18	11	2	16	13	10	4	26	3	15	12	13	3	2	1	14	7

B = Baseline; M =Midline *****statistically significant ($p \leq 0.05$)

Figure 28. Percentage of Favorable Perception toward Hospital Facilities, by Hospital Category



IV. QUALITATIVE RESULTS AND DISCUSSION

A. Key Informant Interviews

The informants include hospital management at all levels, accreditation team and various committee members in the nine study hospitals. We grouped the information into three categories: 1) hospital review; 2) accreditation process; and 3) national health insurance implementation.

1. Hospital Review

Hospital Review General Findings

Based on our Hospital Review scoring system, all variables scores in the midline were higher compared to baseline. All the criteria in Hospital Review increased from baseline to midline, except documentation and record. Documentation is one of important issue that often becomes a priority. The MoH has made guidelines to regulate clinical governance to achieve better quality medical care and patient safety in hospitals. However, implementation of the policy has been poor. Five of nine hospitals performed poorly for reasons such as medical record sheet absences, incomplete clinical information in the medical records, incorrect or missing coding, missing or incomplete discharge summaries and deficiencies in case note storage. Informants from four hospitals admitted that they still had major deficiencies in medical record standards. It is the most common problem faced in many hospitals. This has caused major disruptions in hospital management, especially with the implementation of JKN, given its requirements for accurate medical records for payment of claims.

The number of improved domains in Hospital H is the lowest of all participating sites. Decreased scores showed for patient orientation, clinical practice, medication safety, surgery/anesthesia procedures and documentation and records. The hospital was damaged in an earthquake in 2009 and while much of the facilities had been repaired, they continued to report difficulties with their management systems. Hospitals D and E had the highest number of domains that had increased between baseline and midline. Hospital D was observed to have good management and effective communication with their clinicians. The improvement of Hospital Review in Hospital E appeared to be due to strong leadership and management. In term of the hospital governance domain, improvement occurred in all hospitals except C.

In general the JCI Hospitals group performed better than the other two groups. Five out of ten domains improved, including patient orientation, clinical practice and patient care, health care-associated infection, facilities management; and medication safety. Factors that appeared associated with that included strong management and leadership, a visibly better work culture, effective communication between management and clinicians, funding and logistics support, and human resources. These criteria are closely associated with patient-centered standards and organization management in JCI instrument. It is not possible from this study to determine whether the improvement is due to the fact that they were seeking the international accreditation or because they are the hospitals with the strongest quality systems even before seeking accreditation. These hospitals generally start from a higher base for most indicators of quality performance used in this study. These hospitals appeared to take JCI accreditation seriously, assigning significant human and material resources to the process.

Facility Improvements

In the midline period, we observed that some hospital facilities did not meet standards for patient safety, especially in hospitals H and I. For example fire extinguishers were lacking or beyond their expiration date, some evacuation routes were inadequate of locked and facilities for the disable were deficient. Almost all study hospitals did not meet safety standards because they were built long ago and had not been renovated as standards evolved. New safety standards have been developed by MoH referring to the JCI standards, ISO, and OHSAS.

However, some hospitals had made specific changes since the baseline. For example, Hospital E provided standard ward beds, installed central gas facilities and made supply and evacuation route signs. Other hospitals renovated emergency rooms and constructed a new building for Class 3

patients. Hospital E was planning to build a new kitchen facility because of safety deficiencies in the existing one. Three hospitals were renovating their facilities following the Standard of Facility Management System from JCI primarily related to patient safety.

Facility renovation and management depend on the commitment of hospital management to achieve better quality of care and services. While each hospital has its own financial capabilities and priority, we observed that each hospital has different way of accomplishing it. Some hospitals try to incorporate improvements of their facility in the national budget (APBN), while others tried to work out from their own budget. Other way to equip the hospital is by developing collaboration with the private company.

Eight hospitals had developed cooperation agreements with private companies to provide high-cost medical equipment such as CT scanners and MRI units because it is not feasible for hospitals to provide these with their own budgets. In Bahasa Indonesia, this is called KSO or *Kerjasama Operational*. Both parties agree to share the costs and revenues from operating such equipment for a specified time period. Five hospitals used KSO to provide services in this midline survey. All hospitals have KSOs on hazardous and toxic waste management (In Bahasa Indonesia this is abbreviated as B3 for *Limbah Bahan Beracun dan Berbahaya), and* six hospitals manage their own medical waste. This type of subcontracting can be done by all study hospitals because all have been granted autonomy to manage these arrangements [**14**].

Emergency Services

In accordance with the regulation from the Ministry of Health [**15**] on the Standards of Emergency Services, all hospitals participating in this study are class A hospitals, meaning that emergency departments must have medical specialists on-site for internal medicine, pediatric, obstetrics, and surgery as well as anesthesia. They must also have a resident doctor and a general practitioner trained in emergency medicine and specific nursing and non-medical staff on-site 24 hours a day.

Observation showed that not all hospitals complied with these requirements. In hospitals H and I, specialists do not work on site and if emergency cases require surgery they are usually performed by resident physicians alone. It is stated in the guideline that resident physician must be supervised by a consultant physician who is in charge.

Observation also showed that there are differences in how emergency patients are handled. For example in hospital A, patients are classified based on initial examination in the triage system and categorized as emergency, urgent, not urgent and false emergency. With this categorization system, the handling of patient is no longer based on type of cases. In hospitals E and H, categorization of patients was as emergency (resuscitation) cases or not-emergency (not-resuscitation) cases. Non-emergent cases are then differentiated into surgical, obstetric, pediatric, or internal medicine cases. It seems that the system implemented by hospital A provide much clearer information with regard to the level of emergency. Patients with “false emergencies” can be transferred to outpatient clinics or provided with outpatient service in the emergency room.

Clinical Practice

The MOH has issued National Guidelines for Medical Services (in Bahasa Indonesia abbreviation: PNPK) [**16**], for every hospital to initiate development of clinical guidelines to be followed by clinicians working in the hospital. The midline survey showed that all participating hospitals had such clinical practice guideline (*Panduan Praktek Klinik* or PPK), but some were incomplete. Informants also stated that the PPKs were not yet known and referenced by all hospital clinicians – some did reference them for treatment but others consider them as documents used as a prerequisite for achieving accreditation rather than guidelines for clinical use. There appeared to be no change in the way PPK was implemented in the midline compared to the baseline.

Observations and responses in the midline showed that all study hospitals increased their attention to medication safety standard, and all but one hospital, H, showed improvements. In Hospital D, every prescription was reviewed by pharmacy to ascertain whether the prescription was appropriate for the case. We observed that some hospitals used posters to describe appropriate administration of drugs

and warning of “Looks alike – sounds alike (LASA)” (in Bahasa Indonesia abbreviation is *NORUM for Nama Obat Rupa dan Ucapan Mirip*) medications as reminder for medical staff. In seven of nine hospitals, annual evaluation has been done to examine the appropriateness of the prescription using formulary as the standard.

Patient’s Rights

Midline observations showed that all study hospitals had increased attention to patient’s rights compared to the baseline, but deficiencies were still noted. Indonesian Hospital Law clearly describe patients' rights including the right to choose the doctor, the right to be treated and to refuse treatment after receiving information, the right to privacy, the right to die with dignity, and the right for moral or spiritual support. Article 32 of the Indonesian Health Law explains that each patient has the rights to obtain information on patient rights and obligations, and to obtain effective and efficient health services, avoid physical and material losses, maintain privacy of their medical data, and approve or refuse any medical action which will be conducted by any medical staff against illness suffered by him/her [**17**].

Midline observation showed that seven of nine hospitals had patient rights information in locations readily seen by patients and families. Service facilities generally did not appear well designed to maintain privacy for patients and families. Interviews with hospital personnel showed that there was a different perception of patient privacy among different hospitals and sometimes the practice is different among departments within a hospital. One hospital ward placed male and female patients in one single ward without any curtain. The reason given by an informant was that patients in this ward were over 50 years of age. Also, in five of nine hospitals patient beds in the third class ward were not provided with curtains between beds.

Hospital I did not explain the rights and responsibilities of patients during their stay and three hospitals conveyed only limited information especially on payment mechanisms and treatment to be received by the patient. Informants from three hospitals expressed increased concern on patient’s right after a highly publicized court trial of a hospital medical doctor. They expressed concern that patients will be more critical of hospital services if they understood their rights.

Result from the patient survey showed that not all nine study hospitals explained to patients about their rights and obligations. Hospital I did not explain rights to patients at all, while hospital E generally gave explanation of patient rights and obligations better than the others. Both our qualitative and quantitative findings showed that in eight of the nine hospitals, explanation on the patient’s rights were still far below what was required.

Hospital Information System

Examination of hospital documents generally revealed poor data quality and variability between hospitals, especially regarding performance indicators. It is very difficult to compare their data with the national indicators (Medical Services Standard or *Standar Pelayanan Medik*/ SPM) [**18**,**19**] because of the lack of standardization of indicators, incomplete data collection and low capacity of data collection methods used by some hospitals. One study hospital has no hospital performance statistics at all for certain years. During the baseline, most hospital had collected various data as requested by the Director of Medical Services in the MoH. The MoH conducted several trainings on hospital indicators, performed annual evaluations, and provided special rewards (certificate) to hospitals that have shown high-functioning information system. No hospitals had in place a system to validate their own data.

The only hospital-wide indicator that seemed valid because it was directly linked to reimbursement, was bed occupancy rates (BORs). Overall, this was slightly decreased in KARS hospitals, mixed in JCI hospitals and not recorded in one of the two NHA hospitals. The number of deaths, net death rate and rates of hospital-acquired infection all were not recorded completed in all of the hospitals. Such a fundamental deficiency in tracking important performance data across all three hospital groups represents a departure from international standards. Considering the importance of hospital performance data to determine the quality of services, there is a need for improvement in data management systems and this may require substantial investment.

All study hospitals enter and process medical records information manually, except billing systems. Five hospitals collect census data from the wards every day, submitted those data to the Medical Record unit (IRMIK) who will process data into standardized reports. Observation revealed obstacles for Hospital Information System (in Bahasa Indonesia called *SIRS* or *Sistem Informasi Rumah Sakit*) including lack of a systematic approach, limited resources and lack of training in the four hospitals. There are still many units within these hospitals that do not understand how to use online information systems. Observations in the midline showed that medical record formats greatly affect information completeness. Informants from medical record units in Hospitals C and D stated that medical staff using checklist medical record system completed forms more consistently compared to using blank forms. Checklists system medical record have been implemented in Hospitals A, C and D. As stated by an informant in Hospital D this system of medical record not only encourages completeness of medical records, but also encourages completeness of patient examination and treatment, especially for medical residents.

Midline observation showed that most hospital did not record their associated cause of maternal death. Hospital mortality data only rely on the existing records in the ward register. All patients who die in hospital are sent to the forensic department for the purpose of completing a medical certificate on the cause of death. The death certificate is then sent to the medical record unit and mortality data are recorded and reported monthly. Medical record unit just recorded the women who died while pregnant or during delivery but not the specific cause of death. There was no special reporting system for maternal or infant mortality. Not all of the study hospitals reported total deaths to the provincial health office. Most likely the reported mortality data does not correspond to the actual number of deaths. This needs to be the concern of all parties, so that actual number of death will be recorded. A study conducted by IMMPACT in Banten Province in 2005 revealed that the routine method to identify maternal deaths discovered a higher mortality rate of up to two-thirds of the total number of actual deaths. The difference is due to misclassification against maternal mortality [**20**]**.**

Patient Experience

Perception on Medical Services: Effective communication is a core competence listed by the Medical Council of Indonesia [**21**]. All hospitals except C and D decreased from the baseline to the midline period on this domain which included the doctor's ability to speaking clearly to patients and families, and patient's confidence in the doctors' abilities. This could have been caused by several factors including an increase in the patient-to-physician ratio and the medical education curriculum. It is also possible that implementation of JKN has increased demand for hospital services without an increase in the capacity of the system to supply these services to the same quality. Further investigation is needed to determine this relationship.

Perceptions of nursing services: Almost all hospitals decreased in perceptions of the quality of nursing services from the baseline to the midline period. The exception was a slight increase (2%) in Hospital C. This domain included patient confidence in the ability of nurses and midwives, the responsiveness to patient needs and clinical information sharing. The decline may be due to the shortage of nurses [**22**,**23**]. For example, there was one nurse to every ten patients in Hospital. This was far lower than the MoH Guideline Number 340 on the Classification of Hospitals in 2010 [**24**]. The ratio recommended there was 1:1 in Class A hospitals. Also, the nursing education system has done little to strengthen the quality of nursing services in recent years [**25**]. The MoH has tried to improve the quality of health workers using accreditation of health and medical education institutions and implementing competency tests of all health professional including nurses.

Patient Satisfaction

The patient satisfaction domain includes patient involvement in treatment decisions, the quality of discharge instructions and whether or not the patient would recommend the hospital to a family member. Satisfaction in JCI hospitals increased while the two other hospital groups decreased. It was stated by key informants that JCI hospitals focused on considering the patient as the customer who must be provided with good service.

Otherwise, patient satisfaction decreased generally from baseline to midline. One reason could be implementation of JKN. The first groups to be covered by JKN were active and retired civil servants and military, and Jamkesmas and Jamkesda recipients (both for the poor and near-poor). This means that military and civil servants are now essentially receiving the same services as the poor and near-poor, a situation that those of the former group, at a higher social-economic level, may see as objectionable. This was a matter voiced by some of the informants.

2. Accreditation Process

Role of Accreditation Team

Observation showed that the success of hospitals achieving accreditation depends on many factors including the culture and attitudes towards work, leadership, and the readiness of designated team in the hospitals to implement changes necessary to achieve accreditation. Among the nine study hospitals, five (C, E, F, G, H and I) did not experience consistent changes since the baseline survey, while three hospitals (A, B, and D) showed improvement in many aspects of their operations. The improved hospitals all had active accreditation team who were eagerly pursuing implementation of plans of action towards accreditation while the top management was giving the necessary support and authority. In the other six hospitals this was either not as strong or lacking completely.

Leadership

Leadership is an important component needed to implement change during the accreditation process. Some informants in hospitals that were successfully accredited by JCI and KARS emphasized the role of top management in this process. An informant stated: "*The top level management has a great responsibility on tasks to be done by his/ her staff, and they are aware of all regulations and possible obstacles…. so that the process can run well.*"

Commitment from top management is critical in developing policies and implementing them. Another element required by top level management is financial commitment since significant resources are needed to drive the process of change. Most hospitals spent their budget for in-house training in areas including basic life support, emergency and fire safety, infection control and hand hygiene. Some hospitals also sent their staff for benchmarking to other hospitals. The objective of benchmarking is to learn from other hospitals, which already improve their accreditation level such as Sanglah and Cipto Hospitals.

New Version of Accreditation (KARS 2012)

The GoI revised the hospital accreditation instrument, now called 2012 KARS version. This instrument is based almost entirely on JCI instruments, with the additional instruments related to Millennium Development Goals (4 and 5, especially related to hospital services in an effort to reduce maternal deaths) [**26**]. In this midline study, Hospitals A, B, and D experienced both JCI and KARS accreditation, since it is required that hospitals achieve 2012 KARS accreditation prior to JCI. Informants from these hospitals noted differences between KARS and JCI surveyors, both in the information gathered and the way the surveyors collect that information through observation or examining documents. Informants from Hospitals A, B, and D noted the difference between the JCI and KARS surveyors in the way they examine nosocomial infections, smoking areas around the hospital, and standards of laboratory equipment. The inconsistency of KARS surveyors was a major concern mentioned by informants from all hospitals. As one informant stated: "*To be honest we are really confused. Because according to one surveyor, it should be like this. We're going back to the reference…. But then another surveyor tells us the different thing.*"

Accreditation Process and Hospital Staff Attitudes

Informants in five hospitals (A, B, D, E and G) noted that the accreditation process had changed the attitudes of hospital personnel, especially those whose job were directly related to patient services. Hand hygiene, and cross-checking patient identity before issuing medication are now practiced more routinely than before. More personnel realized that they need to record what they do as well as what they fail to do. Hospital management encouraged medical and non-medical staff to practice their work according to available standard operating procedures and to practice self- assessment. Most

informants stated that changing hospital personnel's mindset, including focusing more on patient safety, was not easy and required considerable time and cost to achieve it.

Hospital Budget for Accreditation

Similar to information from the baseline, in this midline we found that in all hospitals there was a budget for improving facilities or equipment in their annual financial plan. However, nothing was specifically labeled for achieving accreditation even though some renovation and procurement of equipment were directly related to plan for accreditation. Only fund for surveyor visits were usually written clearly as cost of accreditation. It was therefore not possible to report the cost of hospital on all accreditation related activities. As one informant stated:

"*What we have is a routine activity budget including those for special programs. We were a bit confused when our medical director asked that we should make a special budget for JCI accreditation. We cannot do that because in our financial system there is no line item that is suitable for that activity."* (Informant from Planning and Budget unit).

3. Implementation of National Health Insurance (JKN)

Perception of Hospital Personnel on JKN

Interviews with hospital managers reveal that most believe JKN is an excellent program and they strongly supported its policies. In JKN, patient should present first to the Primary Health Facility (PPK 1) – the Community Health Center or a participating clinic. This facility completes the initial screening, and only cases presenting with problem that cannot be handled by this facility will be referred to the PPK 2 (district government hospital or participating hospital). If the cases cannot be handled by PPK 2, then they are referred to PPK 3 [**27**]. All study hospitals are PPK 3, where all the medical specialist and sub-specialist are available. These hospitals now only treat cases with complication. Since the system has just started, its effectiveness and efficiency remains to be seen. As one informant put it: "*JKN is an ideal program, but the implementation is still far from perfect*."

Impact of JKN on Hospitals' Patients

JKN was implemented by BPJS on January 1, 2014 seven months before this midline data collection. According to Indonesian legislation, JKN is compulsory for all Indonesian. The poor and near-poor have their premium paid by government so they are eligible for health services provided by all government and participating private hospitals

In MOH's order on health care referral system [**28**], tertiary hospitals – those in which sub-specialists are available to deliver patient clinical care – can be accessed by patients with government insurance only if they have a referral letter and meet other requirements. For childbirth, the participating hospitals in this study generally only admitted women identified as high-risk pregnancies. This was more the case in the midline compared to the baseline because this referral system was reinforced by the implementation of JKN. Consequently, fewer deliveries occurred in the midline at the participating tertiary hospitals.

Implementation of JKN appears to have had a differential effect on the nine participating hospitals. One is the significant change in caseloads and case-mixes in certain parts of the hospital. For example, one hospital that was providing services for approximately 100-120 deliveries per month in its maternity ward had a decrease in bed occupancy of more than 50% due to the new referral system mandated by JKN. Other hospitals decreased by 20 to 40% in obstetric cases. The changes varied depending on the proportion of patients covered by JKN. The number of patients with government insurance increased sharply with JKN implementation. At baseline, the proportion of Jamkesmas (pre-JKN government supported insurance for the poor and near-poor) patients was around 30%, but in the midline proportion of JKN patients was more than 50%. In some hospitals the proportion up to 80-90% of the total patients. At baseline, the highest proportion of patients paid with out of pocket, and the proportion with government insurance was generally below 50%.

Another impact of JKN implementation is the average length of stay in the hospital as seen in the clinical chart review for AMI patient that decreased by an average of 2 days overall. It is influenced by

the degree of cases handled and service system in the hospital. The use of clinical pathways in patients will be very helpful in providing care and treatment to patients, and this is more apparent in the era of JKN. Here service charge is based on INA-CBG's package, and length of stay will influence the cost of hospital services.

Impact of JKN on Hospital Finance

JKN has had a major impact on hospital finances, especially on liquidity, so far. Out-of-pocket payments are received directly and immediately by hospitals, while government insurance payments go through claim processes that can take a long time and involve several administrative steps. Hospitals are paid based on diagnostic groups. Some hospitals had experience of short-term liquidity problems but were generally more stable in the long-term.

At midline, four hospitals (B, C, F and I) experienced problems with claims presented to BPJS which disturbed their cash flow while other hospitals had no adverse impact. Funding for operational costs in the former hospitals was still safe because they had healthy beginning balance. Hospital I for example, had not received any payment claim from BPJS for 3 months. As a result, incentive payments for medical staff were delayed. A greater impact arose when some suppliers stopped providing medicine or goods because the hospital failed to pay balances for several months. Hospitals C and D has similar experience. At the beginning of the JKN transition, liquidity was very disturbed. The numbers of claims that JKN agreed to pay were too small and problems with other claims need to be fixed. Some problems were caused by incomplete medical record, a lack of understanding of JKN concepts, software that had changed several times, and the productivity of verifier from BPJS. An informant from the Finance Department commented, "*On schedule of payment, usually below our expectation because of delay due to bureaucracy processes. We have submitted the report, but they did not pay us timely. We sometimes have to wait until 2-3 month later*."

One study hospital submitted medical records to BPJS at end of January 2014, but 70% were rejected by BPJS, and after two correction processes BPJS agreed to pay 50% of the amount claimed. To revise the returned files requires great effort by the hospital, involving finance managers, medical record staff and sometimes medical specialist who provided services.

To overcome these problems, hospital management has several initiatives include socialization to the entire staff, especially medical doctors who provide care to patient. They must follow clinical guideline and pathways to be efficient in their services. In Hospital B, management has emphasized completeness of discharge summaries. Other hospitals have appointed medical doctor in every unit as the person in charge. This person has to ensure completeness of charts and claims. However, implementation has not been smooth partly due to lack of compliance by some doctors, mainly the senior ones.

Management of Hospital E seeks to overcome obstacles by evaluating and supervising the service regularly, every month. For example, when reimbursements for the surgery department are high compared to the standard rates, the hospital tried to investigate the cause of the problem.

Initiative to overcome the problem can also come at the department level. There are departments in one of the study hospital that conduct training on the INA-CBG system for specialists to develop a better understanding of the new system, specifically on coding and cost control for medical procedures.

Another aspect of JKN implementation is related to hospital tariffs [**29**]. Under JKN, tariffs are regulated by the Ministry of Health which states that tariffs are based on hospital class (A,B,C,D) and region where the hospital belongs, and this makes some hospitals express their disagreement. Another problem experienced by our study hospitals is the fact that these are teaching hospitals. Compared to non-teaching hospitals, here there are more personnel involved in treating patients, including residents and consultants, which further complicates the provider payment system.

V. CONCLUSION

This study was carried out in nine top (A Class) government owned hospitals located in eight provinces in Indonesia. The overall objective of this longitudinal comparison study is to examine changes in quality and safety performance of these hospitals, among those undergoing the JCI accreditation process, those undergoing the new KARS accreditation process, and the ones which are not due to have any accreditation until 2015. This study is being conducted in three phases: baseline (October – December 2012), mid-line (March- July 2014), and end line (planned in January 2016). Quantitative methods were applied to determine hospital service quality and performance and included clinical charts review for one of four conditions (normal vaginal delivery, pediatric pneumonia, acute myocardial infarction and hip fracture) and interviews from inpatients in four wards (obstetric, pediatric, internal medicine and surgery). We also collected data from observations and reviews of hospital documents, regulations, and policies along with interviews with key informants from all hospitals.

The hospital review captured data in ten domains. An organizational audit was conducted to describe the quality of care at the unit/department level within a hospital related to the four diagnoses listed above. A questionnaire captured patients' experiences with their care during their inpatient stay. A total of fifty five key informants were interviewed.

The following are conclusions based on baseline and midline data.

1. Among the nine hospitals some have been accredited based on the old KARS (2007) standards, three hospitals have been accrediated based on the new (2012) KARS standards, and two hospitals have been accredited by JCI. Government of Indonesia sets requirement that every hospital taking JCI accreditation needs to be accrediated with 2012 KARS as a prerequisite
2. In general we see improvement of hospital status from baseline to midline, with the different trend among the three groups of hospital. In three JCI hospitals, five out of ten variables improved, and these are a) patient orientation; b) clinical practice and patient care; c) health care associated infection; d) facilities management; and e) medication safety. Only one variable (medication safety) which improved in all four hospitals KARS hospitals accreditation, and in NHA hospitals accreditation only “health care associated infection” variable which improved. Overall, JCI hospital showed the most variables improved , followed by KARS hospitals, and the NHA hospitals has the least variables improved.
3. In the clinical review, the midline average score of all hospital was higher than baseline, except that related to medical history in pneumonia case. However, there was no obvious change pattern among the three group of hospitals. , that related to clinical examination for acute myocardial infarction case, the midline score is higher then baseline in seven out of nine hospital, while related to standard intervention in hip fracture case the midline score is higher then baseline in six out of nine hospitals. In one hospital belongs to NHA hospitals group, midline score of all varibles related clinical review is higher then baseline, except one variable (i.e., medical history in pneumonia case).
4. From the patient interview we see that midline average score of the nine hospitals of every variable is lower then that of baseline, except on “overall patient satisfaction”. Midline score of patient perception on facilities is higher than in baseline in hospitals belong to JCI hospitals accreditation group, and that is not the case with other hospital groups. Similarly with overall patient satisfaction.
5. The GoI has developed safety standard on hospital facilities, and all these nine hospitals are trying to meet those standards. Some hospitals have developed operational cooperation with the private company in order to equip the hosptal with high cost medical equipment. Clinical practice guidelines has been developed in all the hospitals following the guidance provided by Ministry of Health, however, this guideline is neither complete nor deligently followed by the clinicians working in the hospital.

6. Increased concern on patient's right has been acknowledged by most hospital personnel, but this concern has not been followed with the significant action. Providing comprehensive information to patient has not been the standard practice in all the hospitals, and there is hospital that still neglect the privacy of patients in the third class ward.
7. Most hospitals, with different degree of enthusiasm from top level management, are in the process of pursuing an accreditation status, either to KARS or JCI. Some hospitals acknowledged that this accreditation process has changed the personnel's mindset towards the more professional attitude and comply with procedures and guidelines in delivering services. On the other hand, critical opinion has been extended to KARS surveyors regarding their inconsistencies in implementing the accreditaion process.
8. Implementaion of National Health Insurance has had a significant impact on hospital, in particular financially. Nevertheless some hospitals have seen this national policy as a challenge to improve their clinical paractice, provider's payment, and financial management.

REFERENCES

1 Soepojo, P., Koentjoro, T., and Utarini, A. Benchmarking of Hospital Accreditation System in Indonesia and Australia. *Jurnal Manajemen Pelayanan Kesehatan* (2002), 5(2): p. 93-101.

2 Irfianti, I. Evaluation of Hospital Accreditation in Indonesia by the Hospital Accreditation Commission (KARS): Perceptions of Hospitals and ISQua Standards. Yogyakarta, 2011.

3 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA. Pedoman Klasifikasi dan Standar Rumah Sakit Pendidikan (Teaching Hospital Classification and Standard Guidlines). MoH RI, Jakarta, 2009.

4 MINISTRY OF HELATH OF REPUBLIC OF INDONESIA (MOH RI). List of Accredited Hospital Version-2012. In *http/kars.or.id/rekap_akreditasi/*. MoH RI, Jakarta, 2014.

5 REPUBLIC OF INDONESIA. Law of the Republic of Indonesia Number 24 of 2011 Regarding BPJS. Republic of Indonesia, Jakarta, 2011.

6 REPUBLIC OF INDONESIA. Law of the Republic of Indonesia Number 40 of 2004 Regarding National Social Security System. Republic of Indonesia, Jakarta, 2004.

7 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Regulation of MoH RI Number 755 of 2011 Regarding Medical Committee*. MoH RI, Jakarta, 2011.

8 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Clinical Practice of Normal Delivery (JNPK-RI)*. MoH RI, Jakarta, 2008.

9 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Asuhan Persalinan Normal (Normal Delivery Care)*. MoH RI, Jakarta, 2004.

10 Van de Werf, Frans, et al. Management of Acute Myocardial Infarction in Patients Presenting with Persistent ST-Segment Elevation. *European Heart Journal* (2008), 29; 2909 – 2945.

11 O'Gara, Patrick T, et al. 2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *American Heart Association* (2012).

12 Skudal, K.E., et al. The Nordic Patient Experiences Questionnaire (NORPEQ): Cross-National Comparison of Data Quality, Internal Consistency and Validity in Four Nordic Countries. *BMJ Open* (2012).

13 Shaw, C., et al. Self-Assessment for Patient Safety in Hospitals. 2012.

14 REPUBLIC OF INDONESIA. Government Regulation Number 74 of 2001 on the Management of Hazardous and Toxic Waste. Republic of Indonesia, Jakarta, 2001.

15 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Decree of MoH RI Number 856 of 2009 Regarding the Standards of Emergency Services. MoH RI, Jakarta, 2009.

16 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Decree of MoH RI Number 1438 of 2010 Regarding the Standards of Medical Care*. MoH RI, Jakarta, 2010.

17 REPUBLIC OF INDONESIA. Law of the Republic of Indonesia Number 36 of 2009 Regarding Health. Republic of Indonesia, Jakarta, 2009.

18 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Standar Pelayanan Minimal Rumah Sakit (Hospital Minimum Services Standard)*. MoH RI, Jakarta, 2008.

19 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Standar Pelayanan Minimal Rumah Sakit (Hospital Minimum Services Standard)*. MoH RI, Jakarta, 2012.

20 Qomariyah, Siti Nurul et al. Identification Process of Maternal Death in Facility. In *Research Report of Indonesian IMMPACT*. CFW UI, Depok-West Java, 2007.

21 INDONESIAN MEDICAL COUNCIL. Competence Standard in Medical Council of Indonesia. Jakarta, 2012.

22 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Decree of MoH RI of 2004 Regarding Guidelines for the Preparation of Health Human Resources Planning in the Province. Moh RI, Jakarta, 2004.

23 Adisasmito, Wiku, et al. Rapid Situational Analysis Report. In *Indonesia: Health System and Pandemic Preparedness*. Jakarta, 2009.

24 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Decree of MoH RI Number 340 of 2010 Regarding the Classification of the Hospital. MoH RI, Jakarta, 2010.

25 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Competency Test of Nurses and Midwifes. In *http://bppsdmk.depkes.go.id/pustanserdik/index.php/pustanserdik/kontenberita/94.* MoH RI, Jakarta, 2013.

26 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). *Accreditation Standard 1st Edition*. MoH RI, Jakarta, 2011.

27 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Regulation of MoH RI Number 71 of 2013 Regarding Health Services on JKN Program. MoH RI, Jakarta, 2013.

28 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Regulation of MoH RI Number 001 of 2012 Regarding the Health Care Referral System. MoH RI, Jakarta, 2012.

29 MINISTRY OF HEALTH OF REPUBLIC OF INDONESIA (MOH RI). Regulation of MoH RI Number 69 of 2013 Regarding Health Care Tariff of JKN Program. MoH RI, Jakarta, 2013.

USAID APPLYING SCIENCE TO STRENGTHEN AND IMPROVE SYSTEMS PROJECT

University Research Co., LLC
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814

Tel: (301) 654-8338
Fax: (301) 941-8427
www.usaidassist.org