

2018

CLINICAL SERVICES REPORT

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FURTHER INFORMATION

This Clinical Services Report is published as part of a suite of reports by Mediclinic International plc (“**Mediclinic**”) in respect of the financial year ended 31 March 2018, all of which are available on the Company’s website at www.mediclinic.com.

AR

[Annual Report and Financial Statements 2018](#)

CSR

[Clinical Services Report 2018](#)

SDR

[Sustainable Development Report 2018](#)

AGM

[Notice of Annual General Meeting 2018](#)

This report was approved by the Company’s Clinical Performance and Sustainability Committee on 22 May 2018.

GLOSSARY

Capitalised terms used in this report are defined in the **Glossary** included in the [Annual Report and Financial Statements 2018](#).

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MEDICLINIC INTERNATIONAL

INTRODUCTION

Mediclinic provides a wide range of hospital-related clinical services throughout its operating divisions. These include outpatient consultation services and pre-hospital emergency services, hospital-based emergency centres, day case surgery, acute care inpatient services and highly specialised services. Support services include laboratories, radiology, radiation oncology and nuclear medicine.

This report provides an overview of the most important characteristics of each operating division, reports on clinical performance for the calendar year 1 January 2017 to 31 December 2017, and summarises the Group's progress against clinical strategic objectives.

During the year under review, the clinical performance of the business was satisfactory across all operating divisions, and several patient safety and clinical effectiveness indicators showed improvement. In addition, many initiatives in support of clinical performance and quality improvement were launched and completed during the year.

Highlights include:

- the restructuring and further strengthening of clinical services leadership at hospital and corporate level across all operating divisions;

- the establishment of a collaborative forum for patient safety, infection prevention and control ("IPC"), and clinical risk management across all operating divisions;
- the refinement of methodologies to measure and report on clinical outcomes to enable divisions to quantify the effect of quality improvement initiatives and objectively measure sustainable clinical performance;
- the establishment of a stroke unit at Mediclinic City Hospital, which was subsequently certified by the German Stroke Society in early 2018;
- the Nursing Summit in May 2017 with nine priority areas identified to improve nursing care in Mediclinic Southern Africa; and
- the certification of Klinik Hirslanden as a cancer centre in prostate and breast cancer by the German Cancer Society, the first private institution to achieve this in Switzerland.

The Group clinical services department consists of a small central team that coordinates clinical services across the divisions. The team provides strategic direction, oversight and accountability, coordinates collaboration across operating divisions, and is directly involved in selected projects.

CLINICAL MANAGEMENT MODEL



CLINICAL PERFORMANCE

Mediclinic developed a framework to support a structured approach to clinical management, the clinical management model. The model comprises two elements: clinical governance and clinical performance. The clinical governance foundation layer provides the structures and processes required for clinical performance. Mediclinic defines clinical governance as: governance including oversight and assurance; systems improvement; medico-legal processes and ethics; research; clinical information; clinical processes and education; and continued medical education. In this report, an overview of some governance aspects is discussed for the group and clinical performance is discussed in detail per operating division.

Clinical performance refers to the quality of the clinical processes and outcomes and is supported by the clinical performance model. The four components of the model are patient safety, effectiveness, cost efficiency and value-based care.

When reviewing clinical performance, bear in mind that the scope of services and model of delivery of each division differ significantly, and that:

- all indicators are reported per calendar year to ensure completeness and consistency, as a significant time lag needs to be provided for the collection of clinical data;
- for comparative purposes, the case mix indexes of the divisions were calculated by using the internally developed clinical and cost-related groupings (“**CCRG**”) system; and
- statistical significance is determined for a subset of the indicators and calculated by determining whether there is a statistical difference when the mean values of 2016 are compared to the mean values of 2017.

GOVERNANCE

Ward-to-Board accountability

The restructuring that resulted from the acquisition of the Al Noor group, and the subsequent listing on the LSE, gave rise to a new Board and Board-aligned committees. One of these is the Clinical Performance and Sustainability sub-committee at Board level. This highlighted the need for greater cooperation and streamlining between and within divisions, as per the strategic decision taken by the Company more than two years ago. We developed a proposal that foresaw the replication of the strategic Clinical Performance and Sustainability Committee at the levels of the operating divisions, as well as at hospital level. This will allow for seamless integration of the information flow and linking these to operational clinical services committees. The latter is being linked with the consolidation of several clinical committees to improve efficiency. The Mediclinic International clinical management team suggested that the clinical services and governance committees make provision for linking in independent experts to take the role of “positive dissenters”. At the same time, aligning the committees and reviewing the differences across divisions also raises the possibility of reviewing organisational pathways of accountability and, therefore, structure.

The initial pilot within the Southern African operating division was successful, with a fully functional divisional committee in place. Hospitals are currently being on-boarded. The next operating division earmarked for implementation in the 2019 financial year will be Mediclinic Middle East, followed by Hirslanden.

Health technology assessments

Health technology assessments (“**HTA**”) should guide the implementation of clinical workflows and equipment in healthcare organisations. HTA look at clinical and cost-effectiveness, and the broader impact of healthcare treatments and tests for those who plan, provide or receive care. HTA research should be undertaken where evidence exists to show that a technology is effective, by comparing it to the current standard intervention to see which works best.

Consequently, there is a role for evaluating the evidence base for medical technology and clinical interventions across the board. This will allow for more strategic deployment of capital and allow money to be spent only on interventions and equipment that are better (i.e. faster, safer, and more cost-effective, among others). This is in stark contrast to the vendor-driven programmes that persuade clinicians of the need for new technology based on hype and good marketing, and the clinicians in turn lobby hospitals to buy equipment for them.

Having established a core competency in HTA, the Company is in the process of strengthening the facility, so, in time, it becomes a core, centrally shared service, enabling better clinical decision-making. At the same time, this expertise aids clinical standardisation.

Electronic health record initiatives

An electronic health record (“**EHR**”) is a transformational tool, as it results in the reorganisation of many and/or all clinical and business processes.

EHR allows for:

- improving quality, safety, efficiency and reducing health disparities;
- engaging patients and families in their care;
- improving care coordination;
- improving population and public health;
- ensuring adequate privacy and security protections for personal health information;
- the centralisation of some clinical services; and
- future-proofing the organisation by laying the foundation for artificial intelligence (“**AI**”) enhanced diagnostics, telemedicine and remote sensing, allowing the Company to expand the business into previously untapped markets.

Implementing a comprehensive digital backbone is a priority in all operating divisions. However, such implementations are business transformative and reach into every aspect of the business. Mediclinic is following a cautious but steady approach when it comes to such implementations.

The operating division in the UAE is in the process of implementing a mega suite EHR, in conjunction with a comprehensive laboratory information system and radiology information system. Linked to the rollout are: widespread user adoption sessions, in addition to the development and sign-off of clinical order sets and pathways. The first go-live is envisaged for the fourth quarter of the 2018 calendar year.

In the Swiss operating division, an EHR, in conjunction with a patient document management system, are being implemented. The first fully-fledged implementation is earmarked for the end of the 2018 calendar year. This project is part of the larger back office centralisation project, HIT2020.

The Southern African operating division is in the process of selecting an EHR solution that will suit the local operating and fiscal environment.

Research

Mediclinic is in a unique position, potentially acting as an attractive partner for multinational, multisite research across its three operating divisions. In combination with cutting-edge medical and surgical care, and strengthened by an EHR backbone in two of the three divisions in the near future, Mediclinic could be a one-stop research destination for multinational medical device and pharmaceutical research. There is much to be said for developing a research culture within a healthcare organisation. This continues to be a growing focus of the Company.

At Hirslanden, a clinical trials unit that was based at Klinik Hirslanden in Zürich, was transferred to the local corporate office, with the directive to provide the necessary know-how and support for all research-related issues both for industry- as well as clinician-initiated research. Hospitals have control measures to ensure compliance with regulations and are subject to oversight.

In Mediclinic Middle East, a group Clinical Research and Ethics Committee was established to oversee, approve and monitor any research done in the operating division. This committee is now actively coordinating and overseeing all research activities in the division with some great early successes. All hospitals in Abu Dhabi and Al Ain were approved for a research licence at the Department of Health (“DoH”).

Mediclinic Southern Africa monitors research being performed within the division and supports clinician-initiated, industry-sponsored research.

Analytics

Healthcare is a data rich environment, and Mediclinic regards its data as a valuable intangible asset. The core of Mediclinic’s analytical capability is concentrated in the centralised Analytics & Reporting department, supported by the Health Information Management (“HIM”) department. The HIM department develops grouping systems and algorithms to enrich data into meaningful information, and provides clinical support to ensure information is applied and interpreted correctly. All the information resides in an international data warehouse. The combined teams developed and maintained

various alternative reimbursement models for Mediclinic Southern Africa, and manage an extensive number of clinical performance indicators. A composite clinical performance indicator was developed and implemented recently. Powerful analytical software is used, and team members undergo regular training. The establishment of a machine learning capability is being planned for the near future.

PROGRESS AGAINST OBJECTIVES

- A master data management programme, compiling and governing data relating to affiliated doctors, was implemented in Southern Africa.
- Clinical performance measures and operational dashboards were refined.
- Established a patient safety sub-committee to standardise and enhance collaboration across the Group.
- Started an initiative to coordinate collaboration of nursing services across operating divisions.
- Established a collaborative forum for clinical risk management across the Group.
- Sourced a clinical adverse event and clinical risk management solution suitable for the Group.
- Initiatives are underway to coordinate health technology assessments centrally. These initiatives will be further refined.
- Thought leadership, oversight and close collaboration were provided in the selection of an EHR system in the Middle East and Southern Africa divisions.
- Continued collaboration and support are provided to Hirslanden with the implementation of its EHR systems.

FUTURE OBJECTIVES

- Implement a clinical adverse event and clinical risk management system across the Group.
- Further refine and optimise the clinical performance model and clinical performance indicators.
- Further drive collaboration on nursing across the Group.
- Support the operating divisions in eradicating never events and decreasing the number of Serious Adverse Events (“SAE”).
- Refine and optimise the medication management process across the Group.
- Establish a machine learning capability.
- Continue to provide thought leadership, oversight and close collaboration in the selection of an EHR system in Mediclinic Southern Africa.
- Develop an integrated clinical digital roadmap, including artificial intelligence, machine learning and telemedicine.
- Continue to collaborate with and provide support to Mediclinic Middle East and Hirslanden with the implementation of their EHR systems.
- Refine and optimise the clinical governance structure to enforce the Ward-to-Board accountability framework across the Group.
- Centrally advise and coordinate clinical research across the Group.

HIRSLANDEN

Hirslanden operates 17 facilities and four outpatient clinics across 11 cantons in Switzerland. The hospital services range from routine procedures and medical treatment plans in seven smaller secondary care community hospitals to highly specialised, complex and technologically advanced treatment modalities in seven larger tertiary care city hospitals.

Most cases are elective in nature, and services, such as advanced neonatal critical care and major trauma, are provided by the cantonal and university teaching facilities. Most admitting doctors are self-employed, but doctors working in the fields of hospital-based specialities, such as anaesthetics and internal medicine, are employed at certain hospitals. Radiology, nuclear medicine and radiation oncology services are, in most instances, owned and operated by the hospitals themselves.

The burden of disease of the Swiss population mainly consists of chronic diseases commonly associated with lifestyle and old age. The burden of communicable (infectious) diseases and trauma is very small. The chronic underlying medical conditions that might be present in a patient on admission to a hospital may have a significant impact on the level of care the patient receives and/or length of stay the patient will experience during hospitalisation. In 2017, the proportion of patients admitted to hospital with chronic underlying diseases was approximately 20%, and hypertension, diabetes mellitus and obesity were the most common diseases present.

The CCRG case mix index of Hirslanden was 1.47 in 2017. This is mainly due to its high load of complex and technologically advanced cases in an older population. In keeping with a high case mix index, Hirslanden's inpatient length of stay for 2017 was at 4.78 days, measured in calendar days.

All Hirslanden facilities are ISO 9001:2008 certified, the international standard that specifies requirements for a quality management system. All hospitals will have to adopt the new version of the standard, ISO 9001:2015 by September 2018, in accordance with which Hirslanden Clinique La Colline, Hirslanden Klinik Aarau, Klinik Belair, Hirslanden Klinik Birshof and Klinik Stephanshorn are already certified. Through this process, all Hirslanden hospitals and operations follow the *Business Excellence* model set out by the European Foundation for Quality Management ("**EFQM**").

Hirslanden has a well-developed organisational structure in clinical management. Every Hirslanden hospital has a person fulfilling the role of a quality manager, an infection control specialist, a critical incident manager as well as several sub-committees for quality, IPC and critical incident reporting. The clinical services department at the Hirslanden corporate office coordinates the activities of the sub-committees, and clinical key performance indicators ("**KPI**") monitor their activities. The affiliated doctors are integrated into this structure by established boards in several specialities.



In addition, the clinical services department performs annual audits on various clinical policies introduced in the hospitals of the division.

There are strict entry criteria for doctors to become affiliated to Hirslanden hospitals. A comprehensive credentialling process, assisted by a clinical committee, is followed. Every doctor is evaluated at least once a year regarding case numbers, infections, re-operations, and liability cases. Any abnormality is taken seriously and investigated by the management of the hospital. Employees can report problems with doctors' performance anonymously. Impairment in performance is addressed by hospital management teams and doctors' committees, and insufficient performance improvements lead to de-accreditation.

The recruitment and credentialling of nursing staff is a rigorous process that includes a trial period of three months, during which three formal assessments take place. The continuous training of nurses is coordinated by training managers in every hospital, and resuscitation training takes place on an ongoing basis.

CLINICAL PERFORMANCE

Patient safety

A patient safety culture is well established in the operating division, as reflected by the low rate of never events and serious adverse events. We report near misses, or critical incidents routinely, and lessons learnt are disseminated to make systems safer and to improve patient outcomes.

Adherence to the safe surgery checklist is a KPI, and is evaluated annually. In contrast to self-reporting compliance rates in the other operating divisions, this is evaluated by audits during unannounced visits to hospitals. The inspection process was changed, and a new focus was set on the accurate performance of the *Team time-out 1* (last check before incision). The 2017 audit cycle is complete and the results show that the sustained focus of theatre management on the checklist is a key success factor.

Adverse events

An important aspect of improving the quality and safety of patient care is preventing adverse events that could harm patients. There are effective systems in place to prevent adverse events and the reporting of near misses is an effective method to improve the processes of care.

Falls

The rate of falls for 2017 is 6.36% higher than 2016, as reflected in **Figure 1**. The increase is not statistically significant. Focused fall prevention initiatives are in place at hospitals with a higher rate.

Hospital-associated skin lesions

Figure 2 reflects a significant decrease in the rate of hospital-associated skin lesions by 23.9%.

FIGURE 1: WEIGHTED AVERAGE FALL RATE - HIRSLANDEN

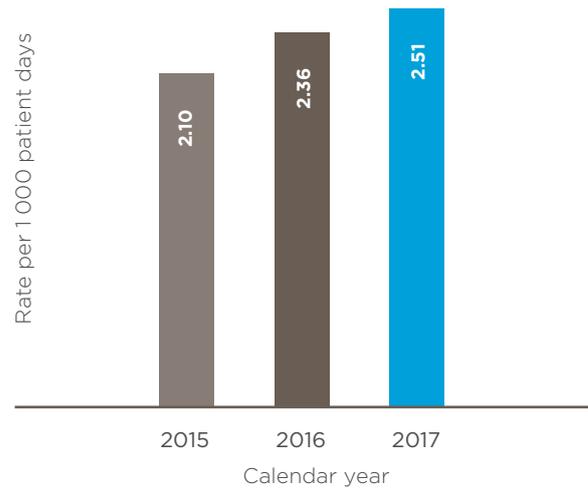
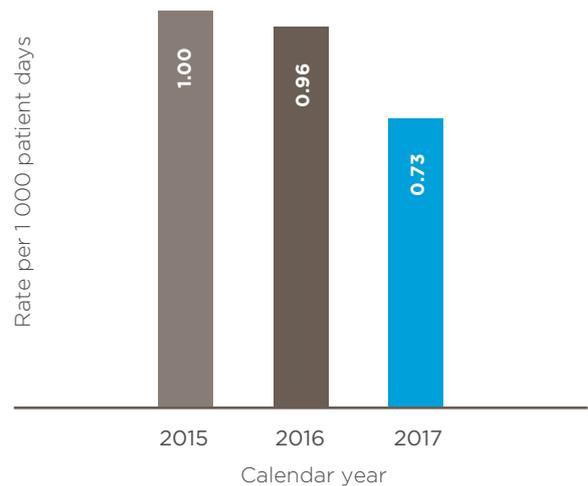


FIGURE 2: WEIGHTED AVERAGE IN-HOSPITAL PRESSURE ULCER RATE - HIRSLANDEN



Infection prevention and control

Performing hand hygiene procedures is critical to preventing healthcare-associated infections (“HAI”), and compliance is evaluated by direct observation by infection prevention specialists.

The HAI and related conditions rate remained stable in 2017. As these conditions are rare, a single infection causes a high rate based on small denominators.

Figure 3 reflects an increase in the catheter-associated urinary tract infections (“CAUTI”) and ventilator-associated pneumonia (“VAP”) rates compared to the prior year. Neither of these increases is statistically significant. The central line-associated bloodstream infections (“CLABSI”) rate remains stable.

Procedure-specific surgical site infections

As reflected in **Figure 4**, the rates of surgical site infections (“SSI”) in reported conditions refer to small numbers with high volatility, and no concerns have been noted.

Antimicrobial stewardship is a valuable component of IPC and, as such, antimicrobial stewardship and clinical pharmacology were included in the wider clinical pharmacy strategy to be completed during 2018.

CLINICAL EFFECTIVENESS

Mortality

Figure 5 reflects a decrease in the in-hospital mortality rate of 2.1% in 2017 compared to 2016, however, the decrease is not statistically significant.

Adult critical care mortality - SAPS II

Hirslanden participates in the mandatory dataset for Critical Care Units (“CCU”) in Switzerland. Simplified Acute Physiological Score (“SAPS”) II is a physiological mortality prediction model that utilises patient attributes to calculate an expected mortality value. The expected mortality rate is compared to the actual mortality rate calculating a mortality index (**Table 1**).

TABLE 1: SAPS II MORTALITY INDEX - HIRSLANDEN

	Hirslanden			SAPS II benchmark
	2015	2016	2017	2017
Cases	8 137	7 691	7 805	84 723
Expected	7.00%	8.00%	8.00%	12.00%
Actual	2.30%	2.20%	2.50%	5.00%
Mortality index	0.33	0.28	0.32	0.42
Average age of patients	68.3	68.0	68.0	61.9
Average length of stay in CCU (days)	2.0	2.1	2.0	2.5
Percentage of ventilated patients	33.3%	36.5%	34.0%	32.0%

FIGURE 3: DEVICE-ASSOCIATED INFECTIONS - HIRSLANDEN

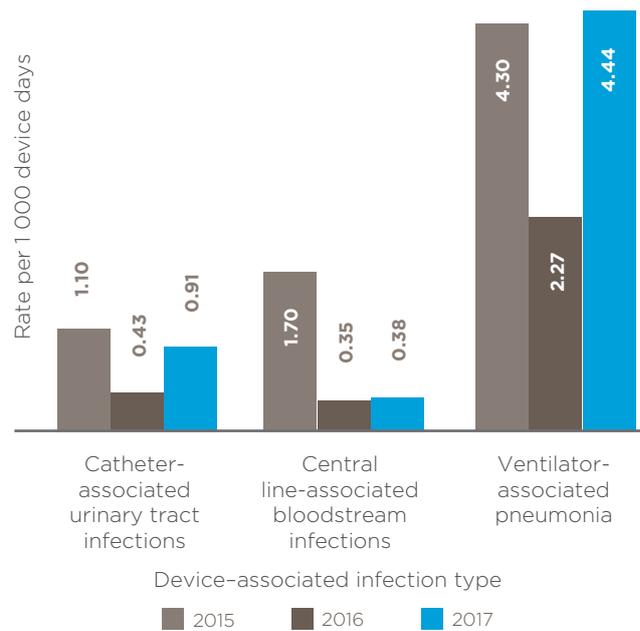


FIGURE 4: POST-OPERATIVE WOUND INFECTIONS FOR SPECIFIC TYPES OF PROCEDURES - HIRSLANDEN

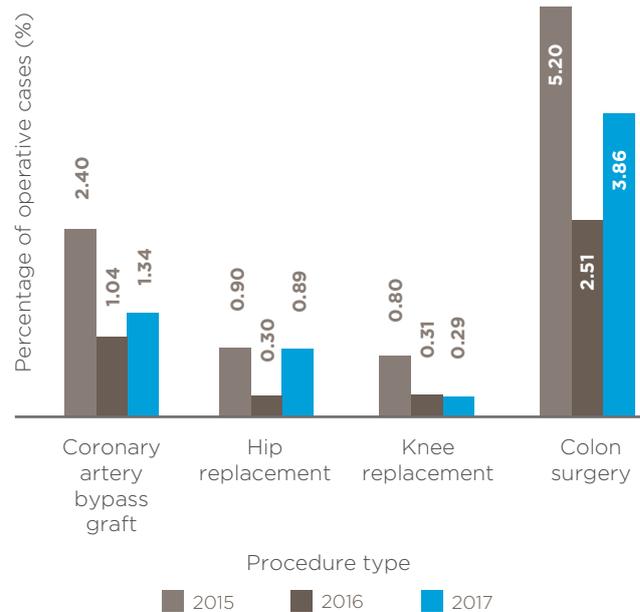
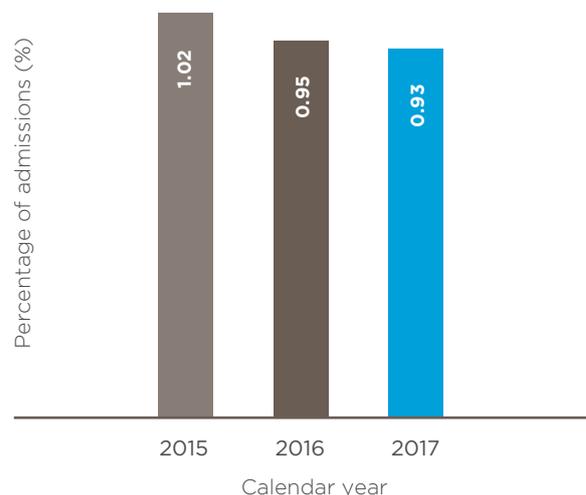


FIGURE 5: WEIGHTED AVERAGE MORTALITY - HIRSLANDEN



Re-admissions

The re-admission rate increased by 19.4%, as reflected in **Figure 6**, however, the increase is not statistically significant. The re-admission rate is reported as a 15-day unscheduled re-admission rate as defined by the International Quality Indicator Project. The 15-day interval was chosen according to the 18-day re-admission criteria of the Swiss DRG system to provide input to the case management process.

In addition, an unadjusted 30-day all-cause re-admission rate is calculated quarterly. The Hirslanden average remains at 5.0%, and is well below international benchmarks. In Switzerland, five years ago, an algorithm was introduced that calculates the re-admission risk based on discharge data (diagnoses and procedures) and compares the expected re-admissions with the actual number of re-admissions. The methodology is called SQLape. The division is evaluating the opportunity of reporting the results of the SQLape methodology half yearly. The first results are expected in the second quarter of 2018.

Re-operation rate

The re-operation rate increased by 4.0%, as reflected in **Figure 7**, however, the increase is not statistically significant.

As stated above, an initiative is underway to test the suitability of the SQLape algorithm to predict related and unplanned re-admissions, as well as re-operations.

Initiative on quality medicine

The initiative on quality medicine is another quality measurement initiative applied by Hirslanden. The initiative has three principles: measure quality based on routine data; publish the results to promote transparency; and improve quality with a peer review procedure. The initiative comprises performance indicators for results, data sets and processes, as well as clinical pictures and treatment forms. Over 380 hospitals are part of the initiative in Germany and Switzerland, with Hirslanden being a member since 2012.

The peer review procedure is an essential part of the quality medicine initiative. Clinically active doctors (the peer team) analyse processes and structures systematically in the original medical procedure. A peer review procedure is initialised if the results are significantly above or below the relevant benchmarks. The core of the procedure is the cooperative case discussion. Some benefits of the peer review are the opportunity to uncover local specialities, identify weaknesses, and establish an open error culture. Principles to be applied are, among others, the clarification of statistical peculiarities, clear process rules and interdisciplinary teams.

There are 300 indicators available, of which 44 already have defined quality targets and 23 are related to patient safety issues. The results are provided on a half-year basis and publicly reported yearly in May. Results are available in English at www.hirslanden.ch. The performance of all hospitals was measured against a subset of 44 indicators (**Table 2**). The performance of the hospitals exceeds the benchmark of the initiative.

FIGURE 6: RE-ADMISSION RATES – HIRSLANDEN

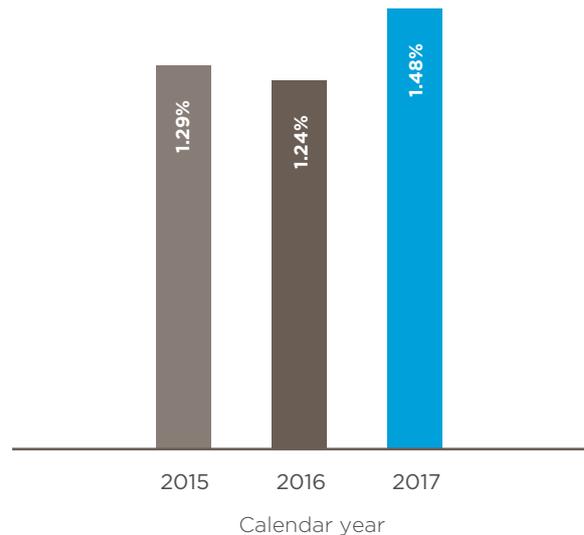


FIGURE 7: RE-OPERATION RATES – HIRSLANDEN

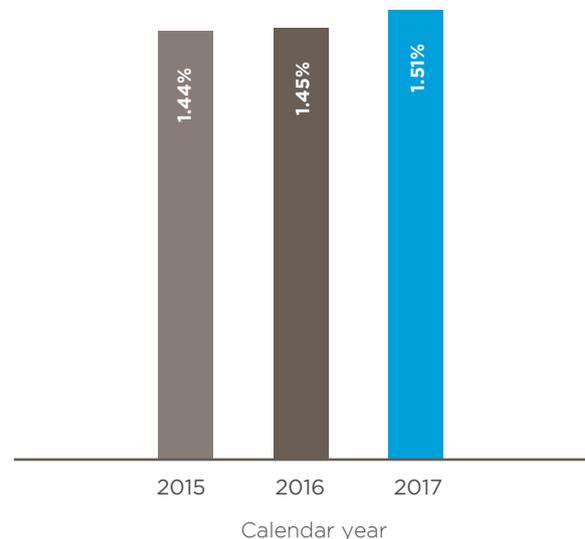


TABLE 2: IQM RESULTS (2017 CALENDAR YEAR) - HIRSLANDEN

	Proportion of cases in IQM indicators (%)	Number of indicators with target achievement	Number of indicators without target achievement	Achievement level (%)
IQM - All participating hospitals	67.30	7 777	2 732	74.00
Hirslanden Klinik Zürich	73.78	36	9	80.00
Hirslanden Klinik Aarau	76.74	37	6	86.05
Hirslanden Klinik St. Anna	78.39	30	10	75.00
Hirslanden Andreas Klinik Cham Zug	67.53	22	3	88.00
Hirslanden Clinique Bois-Cerf	43.14	11	2	84.62
Hirslanden Klinik Belair	62.55	11	0	100.00
Hirslanden Klinik Birshof	42.86	8	0	100.00
Hirslanden Klinik Beau-Site	82.46	37	3	92.50
Hirslanden Clinique Cecil	88.54	29	9	76.32
Hirslanden Klinik Im Park	78.94	40	5	88.89
Hirslanden Klinik Permanence	44.21	20	1	95.24
Hirslanden Klinik Am Rosenberg	40.46	7	0	100.00
Hirslanden Salem-Spital	73.87	21	7	75.00
Hirslanden Klinik Stephanshorn	74.90	28	7	80.00
Hirslanden Clinique La Colline	51.66	24	0	100.00
Hirslanden Klinik Meggen, Klinik St. Anna AG	32.28	9	1	90.00

VALUE-BASED CARE

Prostate and Breast Cancer Centre, Klinik Hirslanden

Cancer treatment is a focus at several Hirslanden hospitals. A comprehensive, multidisciplinary team approach is followed and in line with the business model of working together with affiliated physicians, integration is optimally supported. By structuring and standardising the processes in cancer treatment, the Hirslanden hospital was able to meet the requirements for an external certification of the German Cancer Society. The hospital is the first, and only, private institution in Switzerland to obtain this certification.

Stroke Centre, Klinik Hirslanden

The Klinik Hirslanden is licensed to treat strokes. In 2017, Klinik Hirslanden was successfully re-accredited. The hospital represents the only private institution for stroke treatment in Switzerland.

Fast-track orthopaedics for hip and knee replacement, Hirslanden Klinik Birshof

Hirslanden Klinik Birshof in Basel focuses on orthopaedic cases. In 2017, we launched a project to implement a patient care pathway for hip and knee replacement. The pathway optimises the patient preparation before admission to hospital, streamlining processes during the hospital stay and optimising the use of medication and prosthesis in line with evidence-based medicine. The first procedure was performed in October. To date, more than 50 patients were treated with a one-day reduction in the average length of stay, from six to five days.

Outpatient Surgery Centre, Hirslanden Klinik Im Park

There is an increasing demand for outpatient surgery in Switzerland. Some cantons started with procedure lists where doctors must justify inpatient treatment. Hirslanden prepared for this requirement by setting up an optimised outpatient surgery centre at Hirslanden Klinik Im Park. The unit was opened in 2017 and serves as a blueprint for other hospitals in the division.

Hirslanden Klinik Linde integration

Hirslanden Klinik Linde, a hospital in Biel, was acquired in 2017. Hirslanden was able to convince the former shareholders, many of whom are affiliated physicians of the hospital, that Hirslanden's strategy, approach and business model are aligned with theirs. As clinical governance structures are in place it was possible to refine clinical governance and clinical performance processes and introduce Group performance indicators timeously and easily.

Indication Board Policy for selected indications

Indication quality is becoming a public issue in Switzerland. Indication quality refers to the accuracy of the indication to perform surgery or a procedure, this is especially relevant in highly specialised complex surgery or procedures and oncology. Hirslanden formalised the procedure to evaluate the indication and set up indications boards to evaluate the indication for certain selected conditions. Initially, we will follow the list of requirements set up by the cantonal hospitals for managing indications quality.

PROGRESS AGAINST OBJECTIVES

Patients First at Mediclinic

- Reviewed the compliance of the hospitals with the patient safety policy – the majority of the hospitals implemented every item of the policy or was busy with the implementation of the remaining items.
- Checked the adherence to the safe surgery checklist in unheralded inspections – compared to the previous inspection there was further improvement asserted.
- Initiated a pilot project on patient related outcome measurement – patients were surveyed on quality of life before and after joint replacement. The results show a significant improvement of pain and movement by the procedure.

Value-based care

- Compiled a policy on indication quality and introduction of indication boards – the implementation is planned in 2018.
- Successfully started the project on the introduction of fast track orthopaedics in one of the orthopaedic hospitals of the group.
- Introduced a common structure for highly specialised medicine services.

Clinical information systems

- Compiled the definition of the future documentation in catheterisation laboratories and emergency departments – the manufacturer is busy with the implementation in our electronic patient record.
- Completed the re-evaluation of the radiology information system and selected a new system – the pilot project has already started.
- Reviewed the integration of medical source data and decided to connect this project to the Hirslanden transformation exercise.

FUTURE OBJECTIVES

Patients First at Mediclinic

- Identify patient pathway qualifying for standardisation.
- Complete the introduction of a continuous patient experience survey for all inpatients.

Value-based care

Hirslanden will continue with the definitions of the requirements of the system provider model, and develop evaluation criteria to determine the introduction status per hospital.

Clinical information systems

- Continue with the rollout of the radiology information system in a second hospital.
- Introduce a standardised documentation approach for doctors in the electronic patient record.
- Continue with the rollout of the patient data management system (“PDMS”).
- Conceptualise the integration of the PDMS and the electronic patient record.

MEDICLINIC SOUTHERN AFRICA

Mediclinic Southern Africa operates 52 hospitals, two day clinics and emergency services in 46 of its facilities throughout South Africa and Namibia. ER24 offers emergency transportation services from its 59 bases throughout South Africa.

The hospital services range from routine procedures and medical treatment plans provided in 15 smaller secondary care community hospitals, to complex and technologically advanced treatment modalities provided in 34 larger tertiary care city hospitals, as well as highly specialised and transplant medicine provided in three quaternary care hospitals. Most of the cases are elective in nature, but a significant portion is unscheduled, emergency and trauma related. Admitting doctors, excluding emergency care specialists within certain emergency centres, are self-employed and practise independently. Radiology, laboratory and oncology services are also provided by independent practices.

The burden of disease of the Southern African population consists mainly of communicable (infectious) diseases of which HIV and pulmonary TB are prominent, followed by chronic diseases and trauma. In the medical scheme population, as a subset of the general population, chronic diseases are more prominent, followed by communicable diseases and trauma.

The proportion of patients who were admitted to the division's hospitals with chronic underlying medical conditions in 2017 was 33.7%, and 69.6% of adult patients admitted were overweight or obese. Hypertension, diabetes mellitus and hyperlipidaemia were the most common underlying chronic conditions.

The CCRG case mix index of Mediclinic Southern Africa for 2017 was 1.21 compared to 1.47 for Hirslanden and 1.07 for Mediclinic Middle East. The inpatient length of stay measured in calendar days of Mediclinic Southern Africa for 2017 was 3.8 compared to 4.8 days for Hirslanden and 2.94 for Mediclinic Middle East.

The Council for Health Service Accreditation of Southern Africa ("**COHSASA**") is contracted to accredit Mediclinic Southern Africa hospitals for compliance to healthcare standards. COHSASA is accredited by the International Society for Quality in Healthcare. 37 Mediclinic Southern Africa hospitals are included in the COHSASA contract. At year end, 34 of these hospitals hold COHSASA accreditation.

Mediclinic Southern Africa has a well-developed organisational structure in clinical management. Every Southern African hospital has a patient safety manager, an infection control specialist, and several sub-committees for patient safety, IPC and antimicrobial stewardship. The expansion of a project to appoint hospital clinical managers at most larger hospitals was delayed temporarily due to cost pressure challenges in the healthcare landscape. However, 11 hospital clinical managers were appointed to hospitals caring for more complex cases in the first phase. Feedback on these appointees was positive. In addition to the clinical management support at hospitals, each region has a regional clinical manager supporting the hospital clinical teams.

All treating and admitting medical practitioners must be fully registered with the Health Professions Council of South Africa ("**HPCSA**") or Health Professions Council of Namibia ("**HPCNA**") in the category for independent practice. Medical practitioners work within the scope of defined clinical disciplines as determined by the specifics of their HPCSA/HPCNA registration. The HPCSA determines that doctors may only perform clinical activities relevant to their training and experience. Mediclinic offers practice opportunities to appropriately qualified and experienced medical practitioners according to clinical business needs. Clinical hospital committees and hospital managers, supported by regional and corporate office teams, monitor performance and clinical outcomes.

CLINICAL PERFORMANCE

Mediclinic and the greater Southern African healthcare community have experienced significant and ever-increasing cost pressures; continued shortage of healthcare professionals (especially for specialised disciplines); outmigration of care, resulting in hospitals caring for more complex cases; and an increase in the elderly population. In addition, the Western Cape is experiencing a severe drought with strict water restrictions, which may impact the level of hygiene maintained and may lead to outbreaks.

In the year under review much work was done to enhance the quality of care and prevent harm to patients. Due to the promotion of a reporting culture in the Group, an 8.2% increase in the number of reported adverse events was seen. This is in line with the Group's strategy to promote a patient safety culture.

Patient safety

Achieving patient safety requires a collective commitment to building a patient safety culture. This means that each employee focuses on reporting and learning from near misses and adverse events that may cause patient harm. An open culture, where teams are comfortable discussing patient safety incidents and concerns, is fostered through the inclusive completion of systems analysis of serious adverse events in hospitals. These processes lead to an informed culture because teams learn from the adverse events to mitigate future incidents. Fundamental to this is the just culture, wherein staff involved in adverse events are treated fairly. This included engagement with the human resources (“HR”) department, to align HR disciplinary and clinical reporting/learning processes following a patient safety failure.

These efforts culminate in a learning culture, wherein teams are committed to learn safety lessons, and communicate and remember them. To facilitate this learning, a central portal for patient safety has been developed, as seen in the figure below. The portal hosts resources such as articles, video clips and case studies of actual adverse events relevant to improving the capability to deliver safe patient care.

Adverse events

Preventing never events and SAE remain a focus of the clinical and operational teams. Doctors are regarded as business partners, and play an integral part in reducing surgical never events and keeping patients safe. The World Health Organisation (“WHO”) surgical safety checklist was successfully introduced in all hospitals to decrease errors and adverse events, and increase teamwork and communication during surgery. The compliance rate with the checklist is monitored monthly and near-misses are reported and discussed as learning opportunities to improve the functioning of the system.

Due to a lack of adequately trained and skilled nursing resources in Southern Africa, and globally, a decrease in the quality of nursing care was noted across private and public healthcare facilities. Adverse events relating to medication administration errors, patient falls and in-hospital pressure ulcers, as reflected in **Figure 8**, are regarded as nursing sensitive indicators. High rates of these indicators may be partly due to sub-optimal nursing care.

Medication errors

A statistically significant increase of 35.59% in the medication error rate is noted when compared to 2016. The increase is due to increased awareness and reporting, driven by focused audits. In future, this rate is expected to increase further as additional sources of information, obtained from the audits, is included in the report. A Group project will be launched during the next financial year to optimise the medication management process, including ergonomic principles to optimise processes and improve patient safety.

One of the projects launched to improve medication safety in Southern Africa is the internationally employed Tall Man Lettering method, in trying to reduce errors with look-alike and sound-alike medicines. This is where certain letters of

look-alike/sound-alike names are in capital letters and bold. Currently, the patient administration system cannot handle bold type, but can be changed to accommodate upper and lower-case letters in a product description.

The following are examples:

DOBU T amine	DOP a mine
predni S ONE	predniso L ONE
vinCR I Stine	vinBL A Stine
ceFA Z olin	ceftazidime

Falls

The 7% reduction in the fall rate is not statistically significant. As one of the nursing sensitive indicators, the prevention of falls remains a focus.

In-hospital pressure ulcers

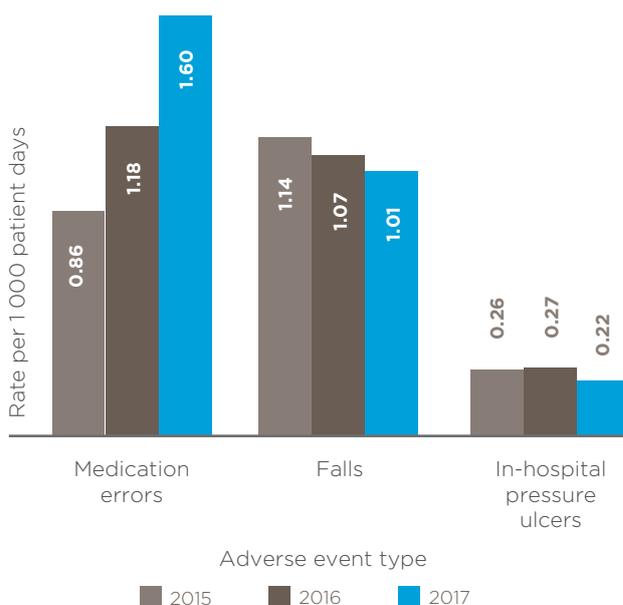
The in-hospital pressure ulcer rate decreased by 25.92%. This decrease is statistically significant and is mainly due to a continued focus on the early detection and prevention of incontinence-associated dermatitis, one of the main drivers of in-hospital pressure ulcers.

Infection prevention and control

Healthcare-associated infections

Southern Africa has a high infectious burden of disease, unlike Hirslanden and Mediclinic Middle East where infectious disease is less of a concern. As such, the prevention of HAI remains a priority for Mediclinic Southern Africa. We follow a multimodal approach to prevent the acquisition and transmission of HAI. Processes and practices are continuously assessed to establish areas for improvement.

FIGURE 8: ADVERSE EVENTS – MEDICLINIC SOUTHERN AFRICA



Across Southern Africa, especially in the northern, Tshwane and central regions, a continued increase was noted in all reported multidrug-resistant pathogens, both community-acquired and healthcare-associated. Hospitals continuously monitor practices to effectively identify high-risk patients on admission and isolate patients with multidrug-resistant pathogens. We continuously monitor adherence to transmission-based precautions, together with hand hygiene compliance and environmental cleaning, to prevent transmission in the facilities.

The HAI rate, as reflected in **Figure 9**, increased by 7.57% over the 2017 calendar year. The increase is statistically significant. The adherence to evidence-based practices, such as care bundles to reduce device-associated infections, remains a focus area. HAI rates and compliance with hand hygiene principles are closely monitored by audits, and hospitals are supported in dealing with outbreaks timeously and efficiently. Hospitals continue to focus on interventions to improve compliance and to focus on the five moments of hand hygiene as outlined by the WHO.

The severe drought in the Western Cape poses several challenges for IPC. In the light of this, surgeons and theatre staff in the Cape Peninsula have been trained on the use of alcohol-based hand-rub for surgical scrub. Prior to the training, a position paper comparing the traditional method for surgical scrub with an alcohol-based hand-rub was distributed to all doctors in the regions for consideration and comment. The practice is approved by the WHO and was well accepted by surgeons and theatre staff.

Although a small increase is noted in all the device-associated infection rates, as seen in **Figure 10**, none of the increases were statistically significant.

The SSI rate, as reflected in **Figure 11**, remained stable.

FIGURE 9: HEALTHCARE-ASSOCIATED INFECTIONS - MEDICLINIC SOUTHERN AFRICA

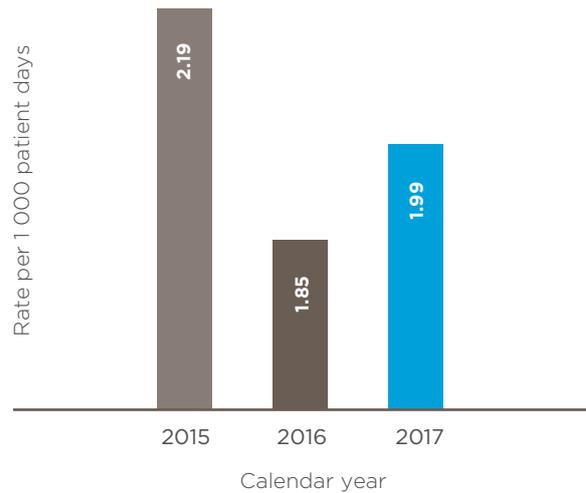


FIGURE 10: DEVICE-ASSOCIATED INFECTIONS - MEDICLINIC SOUTHERN AFRICA

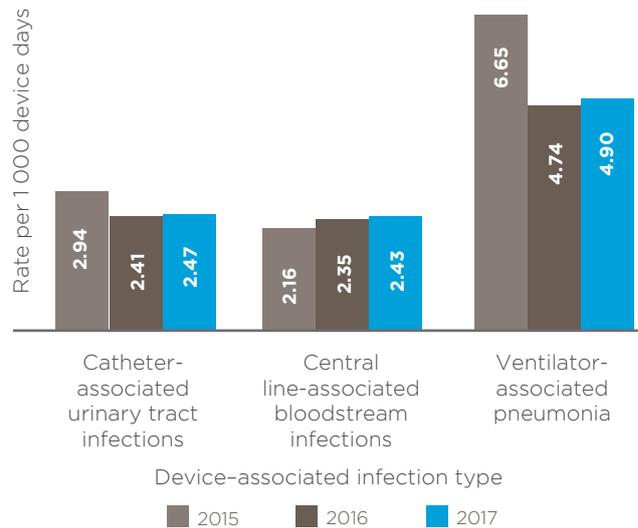
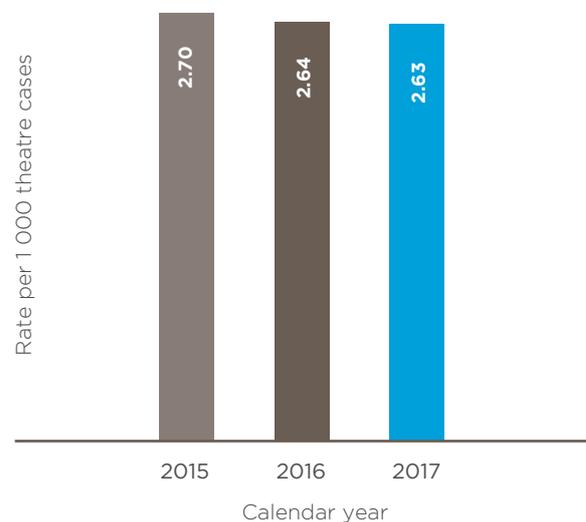


FIGURE 11: SURGICAL SITE INFECTIONS - MEDICLINIC SOUTHERN AFRICA



Antimicrobial stewardship

Considering the high burden of infectious disease in Southern Africa, effectively managing antimicrobial resources and preventing multidrug resistance are critical. Antimicrobial resistance increases with using all antimicrobials and not only certain classes of antimicrobials. The total antimicrobial consumption needs to be reduced. In addition to the antimicrobial utilisation indicators outlined below, Mediclinic Southern Africa also reports that the total antimicrobial usage and utilisation decreased by 1.6% over 2017.

Although a decrease was seen in the undesired surgical prophylaxis rate, the days on multicover rate and prolonged treatment exposure rate increased compared to the 2016 rates, as reflected in **Figure 12**. These indicators are based on administrative and billing data and are continuously refined. Minor changes were made to the methodology for calculating the undesired agents utilised for surgical prophylaxis, therefore the 2017 rate cannot be compared directly to the 2016 rate.

CLINICAL EFFECTIVENESS

Clinical effectiveness measures whether the indication for the treatment was correct and whether the care was rendered timeously. Mediclinic Southern Africa took part in international comparable outcomes databases for several years. Additionally, a set of internal indicators are continuously monitored and refined.

The effectiveness indicators and database overviews include:

- Hospital mortality index;
- SAPS 3 applicable to adult CCU;
- 30-day all-cause re-admission rate;
- Extended length of stay index; and
- Vermont Oxford Network (“**VON**”) neonatal CCU database.

Mortality

The in-hospital mortality prediction model was reviewed and refined in 2016. The 2015 values can therefore not be compared directly to the 2016 or 2017 values due to the change in methodology. When compared to the 2017 index, a 6% decrease is noted, as depicted in **Figure 13**. This decrease is statistically significant.

FIGURE 13: INPATIENT MORTALITY - MEDICLINIC SOUTHERN AFRICA

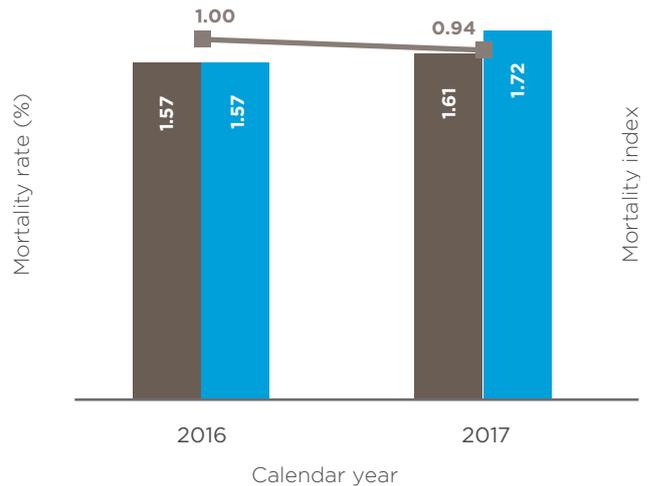
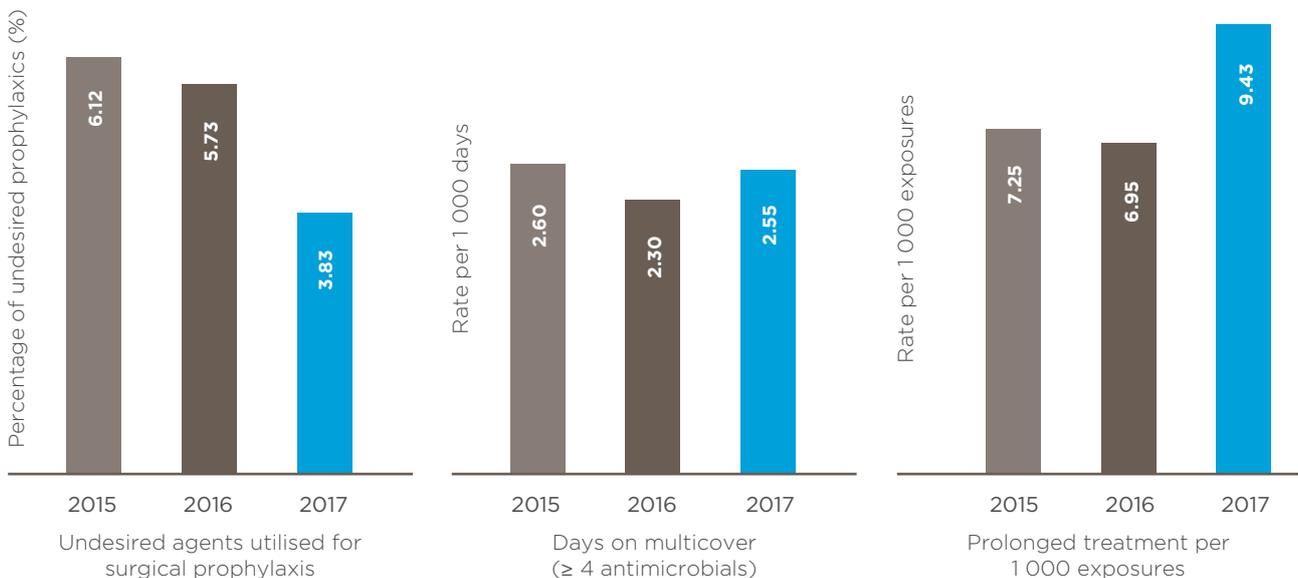


FIGURE 12: ANTIMICROBIAL UTILISATION INDICATORS - MEDICLINIC SOUTHERN AFRICA



SAPS 3 critical care mortality

The SAPS 3 mortality index is statistically lower than 2016 (**Table 3**). This improvement is in part due to a sustained focus on the early identification of patients at risk of complications and responding appropriately to mitigate these risks.

TABLE 3: SAPS 3 MORTALITY INDEX - MEDICLINIC SOUTHERN AFRICA

	2016	2017
Cases	15 016	21 061
Average age of patients (years)	61.61	61.99
Number of mortality cases	2 513	3 575
Mortality rate (%)	16.74	16.97
SAPS 3 expected mortalities (cases)	2 580	3 760
SAPS 3 expected mortality rate (%)	17.18	17.85
SAPS 3 mortality index	0.97	0.95
Average SAPS 3 score	50.67	51.06

Re-admission and length of stay indicators

Mediclinic Southern Africa reports on a 30-day all-cause re-admission rate. The 30-day all-cause re-admission rate refers to patients re-admitted within 30-days of the first admission, whether the second admission is related to the first re-admission or not; and whether this is planned or unplanned. The re-admission indicators are set to be reviewed and refined in 2018 to better identify related and unplanned re-admissions, i.e. potentially avoidable re-admissions. The rate remains unchanged, as depicted in **Figure 14**.

Figure 15 reflects a marginal decrease in the extended stay index of 0.88% when 2017 is compared to 2016. The extended stay index is scheduled to be reviewed in the next financial year.

FIGURE 14: RE-ADMISSION RATES - MEDICLINIC SOUTHERN AFRICA

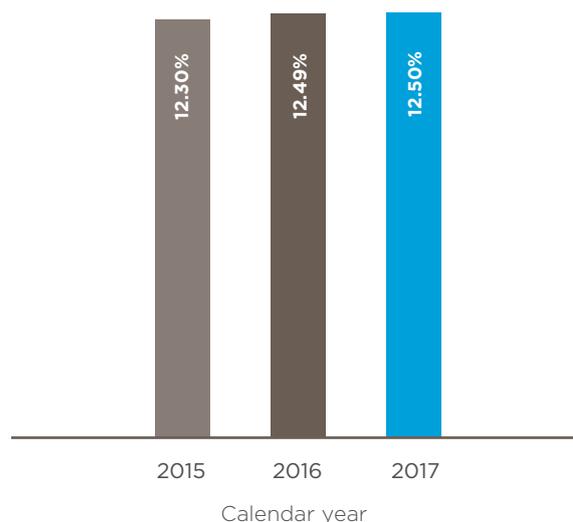
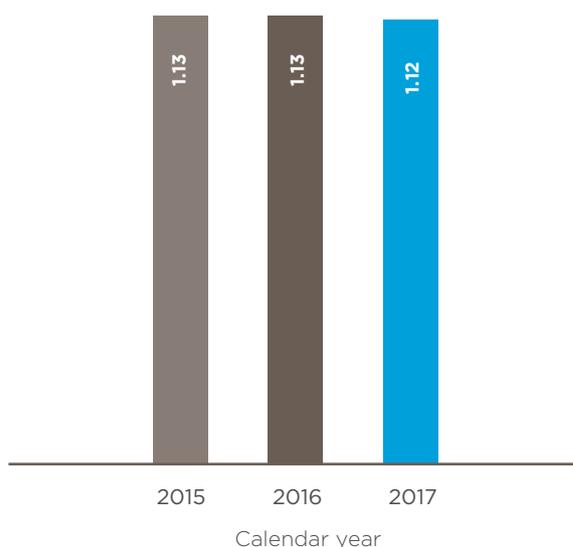


FIGURE 15: EXTENDED STAY INDEX - MEDICLINIC SOUTHERN AFRICA



Adult cardiothoracic database

The adult cardiothoracic database was decommissioned in 2017, mainly due to the problems with the current accuracy and relevance of the underlying formulae to calculate the mortality index in the Southern African context. The model utilised the logarithmic EuroSCORE I for mortality prediction. EuroSCORE I, especially the logarithmic score, overestimates the expected mortality value and leads to false low mortality indexes. An investigation has been launched into the feasibility of taking part in the Society of Cardiothoracic Surgeons, a proprietary database which will allow for international benchmarking of outcomes.

Neonatal mortality and Vermont Oxford Network

Mediclinic has contributed to the VON since 2001 and currently has 26 hospitals registered on the network. The VON is an international initiative aimed at improving the quality of care of infants. There are currently over 1 000 participating centres around the world.

Although Mediclinic Southern Africa captures data on all infants admitted to participating neonatal CCU, included in this report are the very low birth weight (“VLBW”) newborns, as reflected in **Figure 16**. This group includes neonates that weigh between 401g and 1 500g at birth or fall into a gestational age range of 22 to 29 weeks.

FIGURE 16: AVERAGE BIRTH WEIGHT, GESTATIONAL AGE AND ADMISSIONS FOR VLBW INFANTS - MEDICLINIC SOUTHERN AFRICA

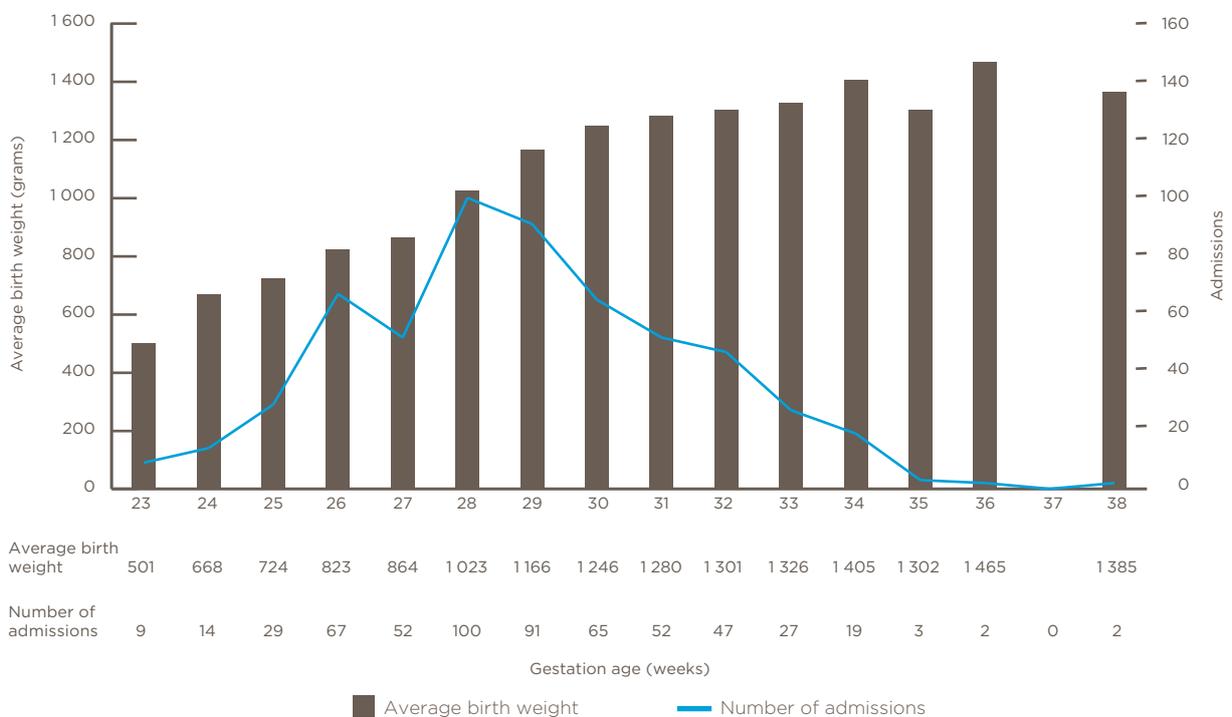
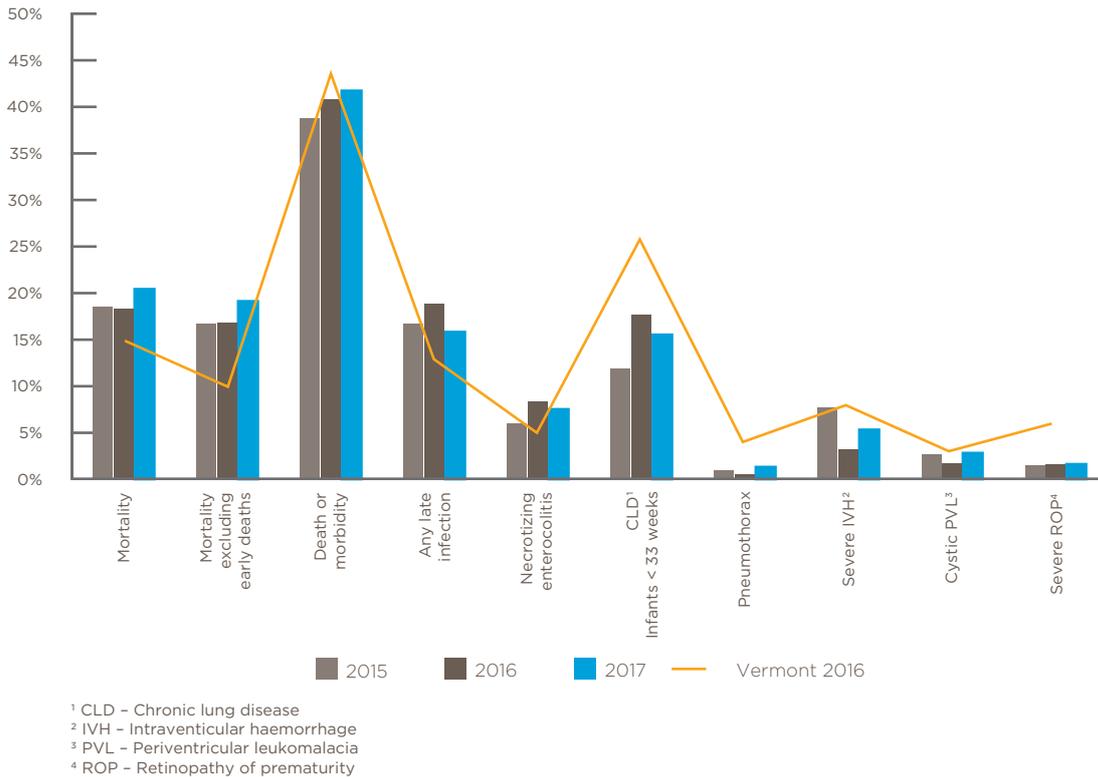


FIGURE 17: NEONATAL KEY PERFORMANCE MEASURES – MEDICLINIC SOUTHERN AFRICA



As depicted in **Figure 16**, most cases are of 28 to 29 weeks gestation and weigh more than 1 000g.

The average number of admissions of VLBW newborns decreased slightly. The mortality rate and death or morbidity rate increased and is above the VON average. The increase is mainly due to a rise in the rate of late infections which is a consequence of the general high burden of infectious diseases in Southern Africa. A sustained focus is decreasing late infections.

Good progress has been made in reducing necrotising enterocolitis (“**NEC**”), which is a serious condition which typically occurs in the second to third week of life in premature infants, and is characterised by variable damage to the intestinal tract ranging from injury to the internal lining of the gut to perforation of the bowel. The good progress seen is being associated with early antibiotic use with no confirmed infection. The VON collaborative “Choosing Antibiotics Wisely” is being rolled out to all neonatal units. As human milk is critical in reducing the incidence of NEC, the availability of safe donor human milk is ensured for this vulnerable population.

VALUE-BASED CARE

Nursing workforce optimisation

The healthcare environment and clinical requirements for care change constantly due to many factors. The nursing workforce must be deployed appropriately to address these changing requirements. A Nursing Summit was hosted in 2017, where senior leadership discussed the challenges in nursing with nursing leadership, hospital management representatives and specialists from several hospitals. The Nursing Summit concluded with nine identified priorities that will be addressed with focused initiatives.

The highest priority was a review of the skills mix and nursing staff allocation. As a result, a new model for the calculation of the required nursing workforce required for safe patient care was developed by a multidisciplinary team and implemented in all hospitals. Additionally, research was done on optimal nursing care requirements (apart from changing the allocated workforce) and a project to address these important elements have been initiated.

Improved patient safety culture

To improve the patient safety culture in Mediclinic Southern Africa the following measures have been implemented: Patient safety is the most important strategic priority; established patient safety managers in each hospital; enhanced the mechanism for reporting and investigating adverse events; and developed mechanisms to improve systems through quality improvement initiatives and the sharing of lessons learnt.

In addition, management teams ensured that clinical KPIs are used to proactively identify risks and develop measures to address these risks. We enhanced clinical leadership through the introduction of hospital clinical managers and new clinical governance structures to support the front-line teams and sustain the improvement.

Introduction of the surgical safety checklist

The process of introducing the surgical safety checklist in all hospitals was concluded, and processes are in place to measure and ensure compliance. Further engagement with doctors working in theatre will improve the communication between management and doctors to ensure the process remains relevant and that teamwork is promoted. By analysing previous adverse events, we identified specific risks that will be addressed in the next year to improve patient safety and optimise theatre processes.

Recognise and Rescue Project

Failure to rescue, a known risk in healthcare, was also recognised as a risk in Mediclinic hospitals. In 2017, we introduced a novel clinical quality improvement project to address this risk. Nursing units participated in this initiative by collecting data on specific measures, analysing the data to identify risks, developing action plans to mitigate identified risks, and testing action plans to ensure they are appropriate and effective.

An important additional step is to ensure the benefits of the project is operationalised and sustained after the close of the project. Early indications show that this project has been very successful in timeously identifying patients whose conditions deteriorate, and that appropriate action is taken. As an added benefit, this has improved nursing staff engagement due to the visible improvements seen in patient care and the direct involvement and support of nursing leadership. The project also positively impacted team dynamics and communication between nurses and doctors.

Ward-to-Board accountability

In line with our corporate strategy to introduce Ward-to-Board accountability, Mediclinic Southern Africa implemented the following two new structures: Divisional Clinical Performance Committee with two external and independent clinical experts; and a Hospital Clinical Performance Committee.

Both new structures will be responsible for overseeing the clinical performance of the operating division. In addition, these structures will be required to provide feedback on risks identified and guidance on how to address these risks.

Doctor alignment

Doctors fulfil an important clinical leadership role in the care provided in Mediclinic hospitals. In the past two years, Mediclinic has embarked on a structured process in which doctor representatives from most hospitals have been engaged in joint strategy discussions to improve clinical care. These discussions are invaluable in understanding the challenges and risks that require attention to reach a common goal of further improving clinical care delivery.

Obstetric care

Obstetric care received specific attention during 2017. Mediclinic supports the BetterObs programme introduced by the South African Society for Obstetricians and Gynaecologists (“SASOG”), aimed at mitigating specific risks in obstetric care. Some of the most important components of BetterObs implemented are the following: nomination of a lead obstetrician in each hospital; standardising the minimum requirements for notes made by each obstetrician; standardising on specific guidelines for obstetric emergencies; the introduction of a schedule for formal meetings between obstetricians, other disciplines and hospital management; and joint training sessions and workshops.

Mediclinic also introduced a specific training programme (supported by SASOG) for all the nursing staff working in the labour wards which will enhance their abilities to deal with obstetric emergencies. We successfully piloted an electronic solution that enables obstetricians to remotely monitor progress during labour. The solution will be implemented in more hospitals in 2018.

We further refined the obstetric dashboard, which enables all hospitals to monitor KPIs for obstetric care.

PROGRESS AGAINST OBJECTIVES

Patients First at Mediclinic

- Implemented the surgical safety checklist in all hospitals.
- Improved reporting of serious adverse events through many initiatives and valuable information was gathered that will guide the future strategy.
- Implemented a successful quality improvement project, which enhanced patient safety and patient care further.
- Developed and implemented a new nursing workforce model to ensure more accurate allocation of scarce nursing skills.
- Successfully launched a national hand hygiene campaign, and developed compliance measures to track improvement.
- Implemented the combined BetterObs and Mediclinic obstetric enhancement projects which will further mitigate risks identified in obstetric care.
- Implemented a specific IPC strategy, which was critical in managing the ever-increasing risk of infectious diseases and multidrug-resistant organisms.

Value-based care

- Implemented a new clinical performance oversight and governance model in collaboration with supporting doctors.
- Developed (in collaboration with supporting doctors) and implemented two clinical pathways led by doctors.
- Developed a comprehensive and integrated critical care strategy.
- Developed a national stroke management strategy.

Clinical information systems

Mediclinic Southern Africa developed a clinical information readiness strategy and a proposed roadmap for evaluating potential solutions.

FUTURE OBJECTIVES

Patients First at Mediclinic

- Complete the implementation of specific patient safety initiatives aimed at preventing adverse events.
- Implement specific training initiatives that will further enable staff to drive quality improvement continuously.
- Develop and implement action plans that will improve hand hygiene compliance further.
- Develop action plans to improve medication safety.
- Further refine clinical performance measures.
- Share more detailed clinical information with doctors.
- Further reduce infection rates through the implementation of a comprehensive IPC strategy.

Value-based care

- Proceed with further appointments of hospital clinical managers.
- Proceed with the further implementation of the new clinical performance, oversight and governance model in collaboration with supporting doctors.
- Develop (in collaboration with supporting doctors) and implement more clinical pathways led by doctors.
- Develop a structured implementation plan for the integrated comprehensive critical care strategy.
- Implement the national stroke management strategy.

Clinical information systems

Mediclinic Southern Africa will engage with specific service providers to evaluate potential solutions for the South African market and commence a thorough assessment of proposed solutions.



MEDICLINIC MIDDLE EAST

Mediclinic Middle East is the largest private healthcare provider in the UAE. The division operates six hospitals and 22 clinics in the emirates of Dubai, Abu Dhabi and the Western Region. The seventh hospital, Mediclinic Parkview, will begin operating in the latter half of 2018.

The relationship between the hospitals and clinics is in the form of a hub and spoke model, where the multidisciplinary clinics deliver primary care and specialist consultation services, as well as follow up from and referrals to the hospitals. The operational model was re-organised in early 2017. Each hospital has a few clinics reporting into the hospital structure, and they function as a cluster. This enables closer collaboration and improved oversight of activities between the hospitals and clinics.

The burden of disease of the UAE population mainly consists of chronic lifestyle diseases and communicable diseases. Chronic underlying medical conditions that might be present in a patient on admission to a hospital, could significantly impact the level of care the patient receives and/or length of stay during hospitalisation. Traumatology is limited to the state health facilities, and patients with major trauma are stabilised and transferred to state facilities.

The 2017 CCRG case mix index of Mediclinic Middle East was the lowest of the three divisions at 1.07 due to its young patient population. Inpatient length of stay measured in calendar days was a relatively short, at 2.94 days, which is in line with its low case mix index.

All Mediclinic Middle East hospitals employ full-time medical directors, who coordinate the clinical activities in the facility, and each hospital has active and functioning clinical hospital committees. The medical affairs board provides feedback to the senior management team, and acts as the clinical oversight and leadership in the hospitals. The multidisciplinary medical affairs board is chaired by the medical director. There are six sub-committees covering key areas, such as infection control, clinical risk management, credentialling, research, patient safety and pharmaceutical use.

Each multidisciplinary outpatient clinic has a practising clinician as its medical director. The medical director is responsible for all clinical aspects of the clinic and forms an integral part of the division's clinical management structure. All physicians undergo a formal credentialling and privileging process through a well-structured credentialling and privileging committee. In the second quarter of 2018, a standardised physician appraisal process will be rolled out.

All doctors will be evaluated annually through a structured doctor performance appraisal process. This includes feedback from peers and patients, reviewing KPIs, and any incidents and quality issues. Privileges are reviewed annually and depends on the physician's activity during the past year and additional skills obtained. Incident reporting is comprehensive, and any concerns raised are dealt with by the medical director and the clinical quality patient safety committee. All patient complaints are carefully investigated. If any problems arise, immediate action is taken, which includes counselling, remedial action, review of privileges or, if appropriate, termination of privileges.

The reporting lines to the chief clinical officer were amended to include the medical legal manager and the research project manager. Clinical research has become important across the combined Group. All research projects must comply with the regulatory framework and are overseen by a Clinical Research and Ethics Committee, and activities are reported monthly.

Hospital accreditation is a mandatory requirement of the Dubai Healthcare City Authority ("**DHCA**"), the Dubai Health Authority ("**DHA**") and the DoH in Abu Dhabi.

Mediclinic Al Noor Hospital in Abu Dhabi was successfully re-accredited by the Joint Commission International ("**JCI**") in November 2017.

In addition to the JCI accreditation, the laboratory of Mediclinic City Hospital achieved The College of American Pathologists accreditation in 2009, 2011, 2013, 2015 and 2017. Mediclinic City Hospital laboratory obtained ISO 15189:2009 certification in 2010, 2013 and early 2016. All laboratories in Abu Dhabi, Al Ain and the Western Region were successfully ISO certified in February 2018.

CLINICAL PERFORMANCE

Patient safety

The patient safety culture is well entrenched in Mediclinic Middle East. It is a just culture with full support from senior management. *Patients First* is also the top strategic priority for Mediclinic International and the Mediclinic Middle East division is well aligned to support the Mediclinic Group's strategic objectives. A patient safety culture survey is undertaken regularly, and findings inform the clinical strategy.

Adverse events

All SAE, including never events, are investigated by a comprehensive, systematic analysis for identification of contributory factors and system-related errors. We employ a team approach in managing these events, which includes, but is not limited to, the medical and nursing directors, quality and patient safety officers, and other parties as required.

The WHO surgical safety checklist was rolled out in all the Group's facilities, and is an effective tool to avoid surgery or procedure-related never events. Compliance with the checklist is mandatory. All cases with potential medical legal consequences are reported monthly and a summarised version is shared with the medical legal manager and insurer.

Medication errors

The medication error rate increased markedly in 2017 compared to 2016, and the increase is statistically significant (**Figure 18**). In Mediclinic Middle East both outpatient and inpatient medication errors are reported and are classified as prescription, dispensing and administration errors.

The majority of medication errors were prescription errors, and were identified and corrected before reaching the patient. Insurance rejections were incorrectly reported as medication errors, which contributed to the high outpatient medication error rate in Mediclinic Middle East.

There is a continued focus on medication management. Focused medication audits and physician education and training are ongoing in all facilities. The implementation of the new EHR should play an important role in decreasing medication errors. The trend will be monitored and reported on an ongoing basis.

Falls

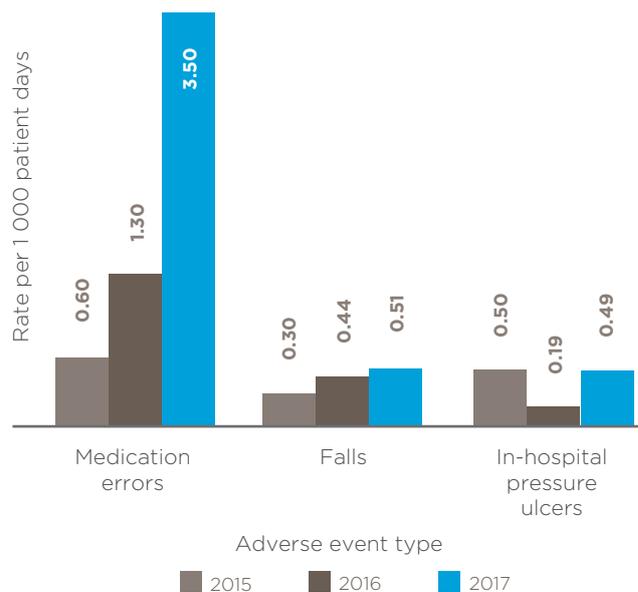
The fall rate increased by 25%, but is not statistically significant (**Figure 18**). Fall awareness and prevention remain a focus area for Mediclinic Middle East. The fall awareness campaign includes educational videos for employees, fall prevention posters in patient rooms, and creating a fall prevention booklet for patients and visitors.

Training for clinical staff in the division recommenced. The clinical education department is working on a programme in collaboration with the rehabilitation department.

In-hospital pressure ulcers

The in-hospital pressure ulcer rate increased by 150% compared with the 2016 rate, which is statistically significant (**Figure 18**). Various quality improvement projects were initiated, specifically in the CCU where the patient population has higher acuity levels with multiple co-morbidities. A steady decline in the in-hospital pressure ulcer rate was noted in the latter part of 2017, and the trend will be closely monitored.

FIGURE 18: ADVERSE EVENTS - MEDICLINIC MIDDLE EAST



Infection prevention and control

Healthcare-associated infections

Preventing HAI remains a key patient safety objective for Mediclinic Middle East. This includes standardising processes around infection control (based on international best practices), implementing care bundles (SSI, VAP, CLABSI and CAUTI) and a surveillance programme with a multilayer methodology. This methodology includes surveillance that is active and passive, patient and laboratory-based, prospective and retrospective, priority-directed and comprehensive.

A divisional infection control committee was established to standardise the infection control policies and procedures across the division. We have dedicated, internationally certified infection control officers in each hospital and in the ambulatory care facilities. This is the combined responsibility of the head nurse and the medical directors of the clinic. Infection control link team members are identified for each facility and receive regulatory authority accredited training.

Figure 19 shows the decrease in the HAI rate by 12.5% from 2016 to 2017. This decrease is not statistically significant. There is a continued focus on current IPC practices in the division, with a specific focus on the implementation of care bundles in the CCU and compliance to antibiotic prophylaxis guidelines.

Figure 20 reflects that the CAUTI rate decreased by 15.9%, the CLABSI rate decreased by 13.6% and VAP rate decreased by 76.1% compared to 2016. Although the decrease in the CLABSI and CAUTI rates are not statistically significant, the decrease in the VAP rate is. A change in the Centres for Disease Control and Prevention definition of HAI, especially for VAP, contributed significantly to the decline in the rate.

Figure 21 indicates that the SSI rate decreased by 27.7% when compared to 2016, however, the change is not statistically significant.

Antimicrobial stewardship remains a focus area. Antibiotic stewardship programmes are in place across the group and standardised antibiotic guidelines are available on the Abu Dhabi and Dubai campuses.

FIGURE 19: HEALTHCARE-ASSOCIATED INFECTIONS - MEDICLINIC MIDDLE EAST

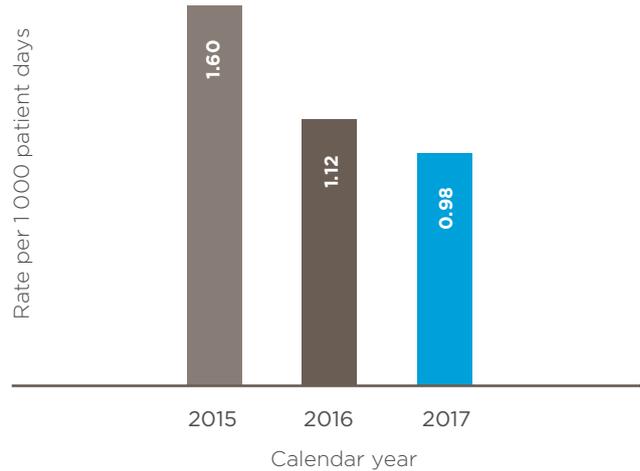


FIGURE 20: DEVICE-ASSOCIATED INFECTIONS - MEDICLINIC MIDDLE EAST

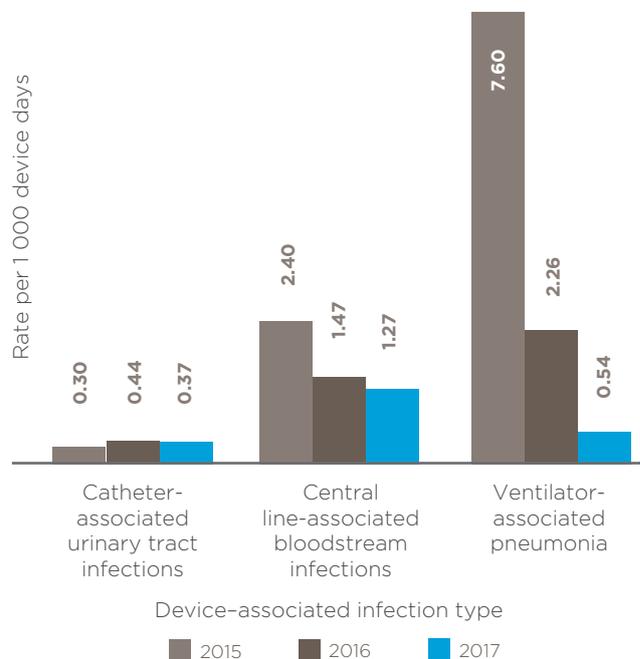
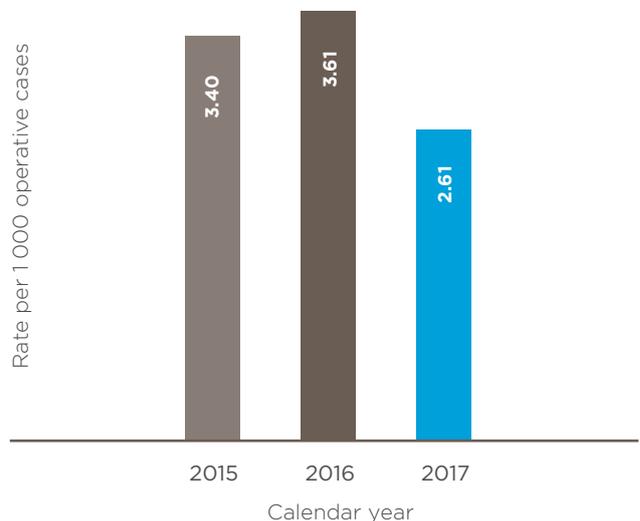


FIGURE 21: SURGICAL SITE INFECTIONS - MEDICLINIC MIDDLE EAST



CLINICAL EFFECTIVENESS

Mortality

The inpatient mortality rate for the division is low, and decreased by 4.16% compared to 2016. All unnatural deaths are discussed and reviewed at the Hospital Mortality and Morbidity Committee (a subcommittee of the Clinical Quality and Patient Safety Committee).

Figure 22 reflects a 4.16% decrease in the mortality rate in 2017 compared to 2016, however, the decrease is not statistically significant.

Figure 23 indicates that the re-admission rate increased by 12.24% compared to 2016, however, the increase is not statistically significant.

SAPS 3 critical care mortality

SAPS 3 has been implemented in all the CCU in Mediclinic Middle East since October 2016. It replaced the APACHE IV scoring system, which was only implemented in the Dubai facilities. This will ensure that outcomes can be benchmarked across the Group. The data collected for 2016 was only part of the calendar year and not suitable for including as a comparative value for 2017. The performance of the SAPS 3 model was calibrated. Even though the mortality index is 1.4 (**Table 4**), the crude mortality rate is low. The predicted mortality rate is influenced by the accuracy of the data, and the validation of data quality is a focus area for 2018.

TABLE 4: SAPS 3 MORTALITY INDEX - MEDICLINIC MIDDLE EAST

	2017
Cases	2 269
Average age of patients (years)	41.0
Number of mortality cases	68
Mortality rate (%)	3.0
SAPS 3 expected mortalities (cases)	49
SAPS 3 expected mortality rate (%)	2.14
SAPS 3 mortality index	1.4
Average SAPS 3 score	56.3

FIGURE 22: INPATIENT MORTALITY - MEDICLINIC MIDDLE EAST

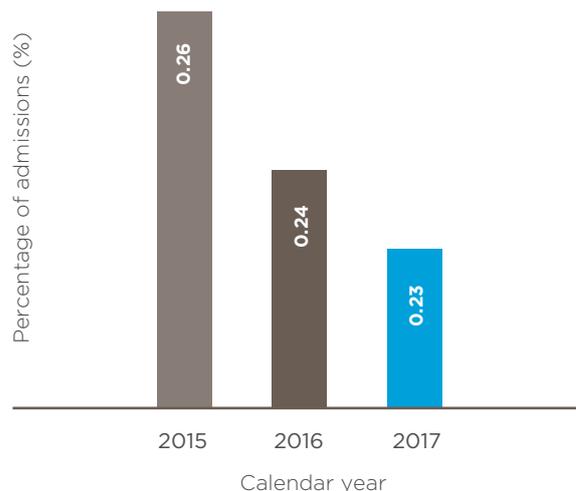
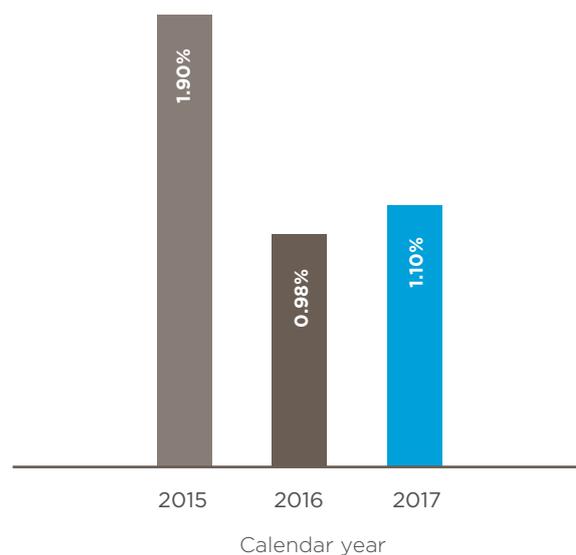


FIGURE 23: RE-ADMISSION RATES - MEDICLINIC MIDDLE EAST



Vermont Oxford Network

The Vermont Oxford database participation is well entrenched in the Mediclinic Middle East facilities and was rolled out in both hospitals in Abu Dhabi, as well as the Mediclinic Al Ain Hospital from 1 January 2017. This is an important initiative to measure performance and improve the quality of care delivered to our patients.

Figures 24 and **25** indicate that the number of VLBW cases admitted to neonatal intensive care units are low however the outcomes are in line with the key performance indicator of VON.

FIGURE 24: AVERAGE BIRTH WEIGHT, GESTATIONAL AGE AND ADMISSIONS FOR VLBW INFANTS - MEDICLINIC MIDDLE EAST

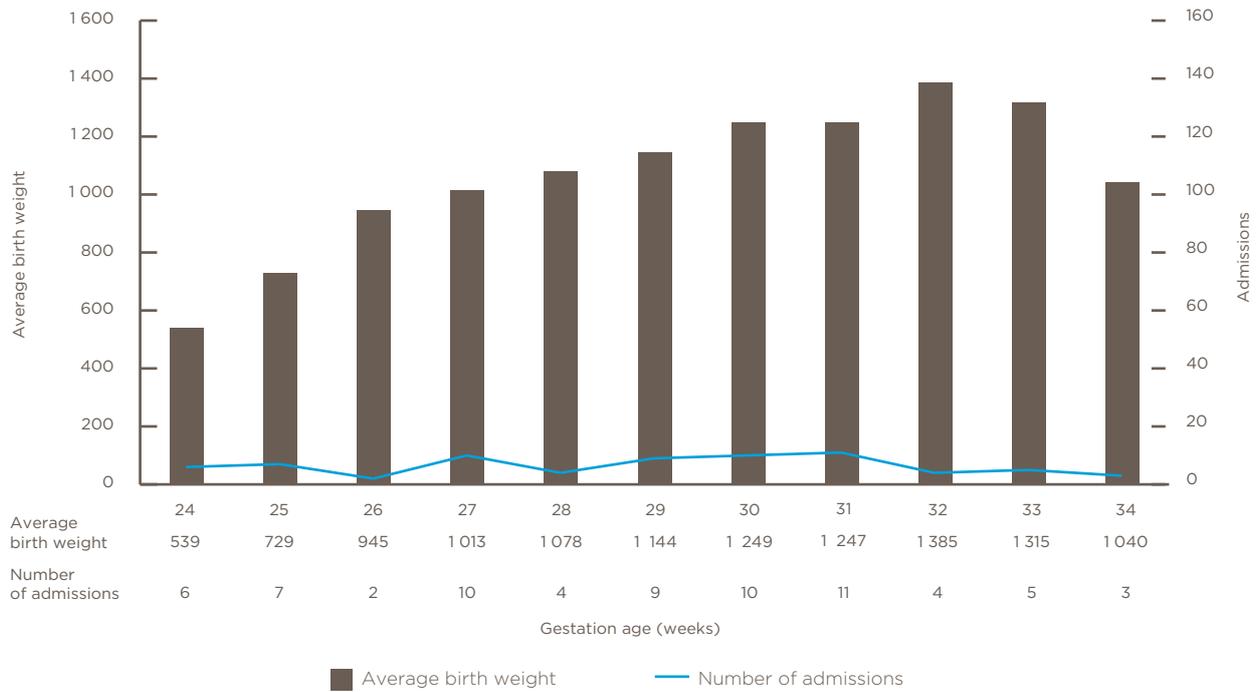
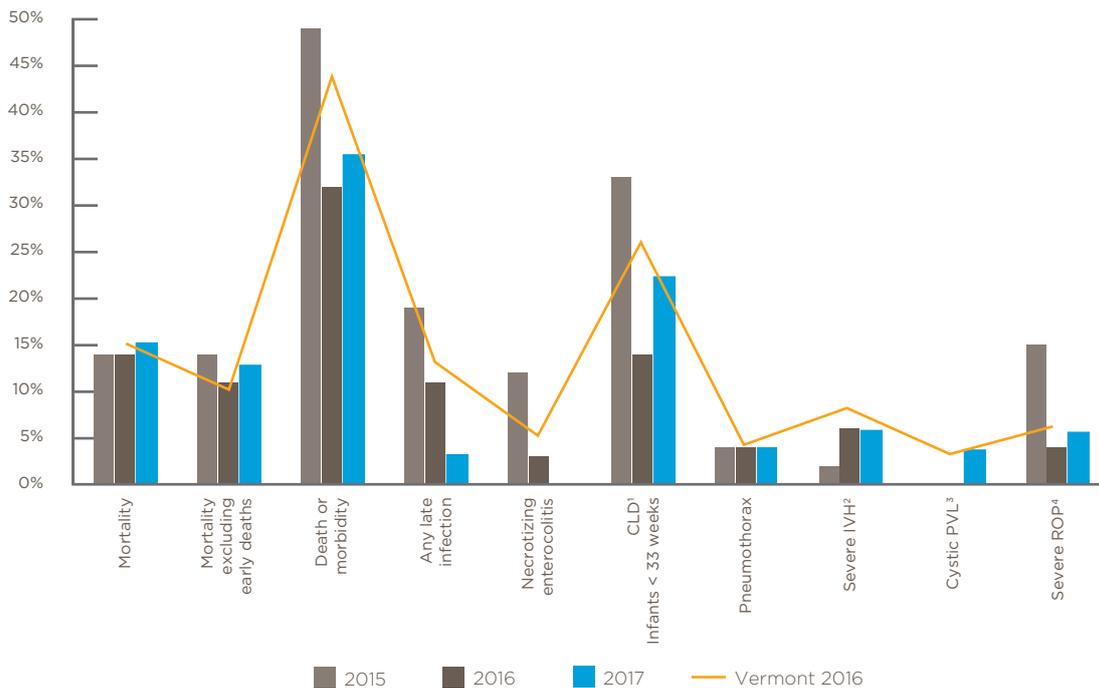


FIGURE 25: NEONATAL KEY PERFORMANCE MEASURES - MEDICLINIC MIDDLE EAST



¹ CLD - Chronic lung disease
² IVH - Intraventricular haemorrhage
³ PVL - Periventricular leukomalacia
⁴ ROP - Retinopathy of prematurity

VALUE-BASED CARE

Comprehensive Cancer Centre, Mediclinic City Hospital

The Comprehensive Cancer Centre (“**CCC**”) at Mediclinic City Hospital has been operating successfully since its opening in late 2016. It provides a full range of cancer services utilising a multidisciplinary approach in management.

The CCC team has grown since the start, and now consists of 12 surgeons, two medical oncologists, three haematologists, two radiation oncologists, two nuclear medicine consultants, two physicists, 10 specialised nurses, seven technologists and a dedicated reception administration team.

The specialised multidisciplinary team provides care for all cancers, the five largest patient groups being breast, colorectal, gynaecological, head and neck, urology and brain cancer. Breast cancer is the most common type of cancer, and these patients are served by a highly skilled team consisting of specialised surgeons, breast radiologists, and radiation oncologists, in addition to a dedicated breast care nurse.

The professional work of the clinical team is supported by Hospital Angels volunteers, who help with psychological and physical support to cancer patients. The Hospital Angels are drawn from community volunteers in addition to medical students from Mohamed Bin Rashid University, which is affiliated with Mediclinic City Hospital.

The CCC continues to introduce the latest technology to the region, and in 2017 introduced two new techniques in radiation oncology, namely Stereotactic Radiotherapy Surgery and Stereotactic Body Radiation Therapy. To date, 13 patients have benefited from these new advances in radiotherapy. The plan is to introduce Brachytherapy and to treat the first patient with this technique in early May 2018.

The number of patients treated at CCC has been consistently increasing since the centre’s opening. In 2017, 517 cancer patients were investigated and treated (303 patients in 2016). In the past financial year, the centre saw 250 new patients in radiotherapy, and delivered 3 200 chemotherapy sessions, 730 PET scans and 10 300 outpatient visits in (medical oncology).

Mediclinic is active in the promotion and prevention of cancer. We participated in the world cancer day in February 2018 with the “We Can” screening campaign.

JCI Clinical Care Programme Certification is targeted for 2018 to ensure the highest level of quality of cancer services. We have a plan for extensive collaborative work between all the oncology disciplines to achieve standardisation of clinical pathways to ensure quality of cancer services across Mediclinic Middle East hospitals and clinics.



Laboratory services

The financial year 2018 has been a year of achievement for the Group's laboratory services. We made significant progress on all key objectives including, but not limited to, service consolidation, operational efficiency and clinical effectiveness, cost control, quality assurance including accreditation, and modernisation of services.

In 2017, 10 small and peripheral laboratories were decommissioned and three large central laboratories were created in Dubai, Abu Dhabi and the Al Ain regions. A new laboratory was opened in Al Jowhara hospital, with a plan to open another laboratory in the forthcoming Mediclinic Parkview Hospital. We created a sophisticated and efficient logistic plan to serve the extended laboratory network to ensure effective turnaround time for results.

We achieved laboratory service efficiency and increased staff productivity through an effective HR plan, including clearer definitions of roles and suitable job planning with continuous monitoring of staff performance and productivity. In addition to service provision, the senior laboratory employees are closely involved in multidisciplinary team meetings to support clinical colleagues in key clinical services such as oncology, gastroenterology and neurology.

The laboratory service was able to achieve greater cost efficiency through a successful contract negotiation and developing a partnership with one of the main suppliers of laboratory reagents and consumables. The service contract

process is clear and transparent, with well-established procedures for procurement and contracting that have the approval of all our stakeholders. This led to a well-coordinated supply chain to support our large panel of tests and products.

Service modernisation is a key objective of the laboratory services. Two areas were achieved to date, including the introduction of the most modern division for chemistry analysis and agreement of the plan to introduce full automation to core laboratory services. The second area for modernisation was the upgrade of the laboratory information system in the Abu Dhabi and Al Ain regions. The laboratory service is currently working on implementing the new laboratory system from the hospital information system - Bayanati Intersystem project.

As for quality management, the laboratory service proactively monitored all essential laboratory KPIs for quality management and assurance of the laboratory service as outlined by quality management systems such as CAP and ISO 15189 (**Table 5**). All Mediclinic Middle East laboratories are participants in proficiency testing, and all achieved ISO 15189 and/or CAP laboratory accreditation schemes in 2017.

Overall, Mediclinic Middle East laboratory services had a successful year, and the laboratory service is streamlined efficient and ready to face the challenges of healthcare businesses of the Middle East.

TABLE 5: LABORATORY SERVICES QUALITY MANAGEMENT

	DUBAI		ABU DHABI AND AL AIN	
	2016	2017	2016	2017
Number of laboratories	8	4 (new MPAR)	11	5 (new MJOW)
Laboratory accreditations	CAP & ISO 15189	CAP & ISO 15189	None	ISO 15189
Test centralisation	Limited	Completed	None	Completed
HR plan	None	Completed	None	Completed
Effectiveness	Partial	Measured and audited	No evidence	Measured and audited
Efficiency/productivity	Partial	Measured and audited	No evidence	Measured and audited
Contracts	Controlled & Coordinated	Full control (laboratory, legal and SC)	Hospital control	Full control (laboratory, legal and SC)
IT/LIS	Complete network	LIS project ready	Fragmented system	Upgraded network LIS project ready
Supply chain	Coordinated	Coordinated	Fragmented	Coordinated

Note:

The information reflects changes made to laboratory structures and services since the acquisition of Al Noor in 2016.

PROGRESS AGAINST OBJECTIVES

Patients First at Mediclinic

- Appointed quality and patient safety officers, established a quality department on corporate level and updated its patient safety strategy.
- Mediclinic Al Noor hospital was successfully re-accredited by JCI in November 2017.
- Standardised clinical indicators across the group, and created a central repository.
- Implemented SAPS 3 in all CCU across all the Mediclinic Middle East hospitals.
- Implemented the VON databases in all the division's facilities.
- Combined the clinical services departments of the group, which was implemented, expanded and embedded in all the clinical oversight committee structures.
- Developed clinical KPIs for doctors, and will be part of the formal doctors' appraisal process implementation plan for 2018.

Value-based care

- The division expanded on the affiliation agreement with the Mohammed Bin Rashid University of Health Sciences ("MBRUHS") in Dubai. Mediclinic City Hospital is an accredited external training facility for medical students, and the second intake of medical students was enrolled in September 2017.
- Mediclinic Middle East hosted a successful first annual research day in February 2018 at MBRUHS.
- We developed the current breast and metabolic centres at Mediclinic City Hospital to streamline clinical processes.
- The division commissioned a stroke centre at Mediclinic City Hospital and obtained the certification by the German Stroke Association in January 2018.
- Mediclinic Middle East successfully commissioned and opened the new CCC in the north wing expansion at Mediclinic City Hospital.
- The division signed off a cancer strategy that includes the clinical oversight structure, site-specific tumour board structure and function as well as scope of service delivery at the different facilities.
- The division implemented the centralisation and consolidation strategy of laboratory services for the group.
- Mediclinic City Hospital laboratory was successfully re-accredited by CAP in August 2017.
- Successfully obtained the ISO certification for all the laboratories in the Abu Dhabi, Al Ain and Western Region.
- Mediclinic Middle East relocated and commissioned the in-vitro fertilisation ("IVF") and dialysis centres (previously located in Mediclinic Al Noor hospital in Abu Dhabi) to Mediclinic Al Ain hospital.
- Mediclinic is in the process of reviewing the existing clinical pathways and developed additional pathways in preparation for the implementation of diagnosis-related groups and the implementation of the new EHR system.

Clinical information systems

Mediclinic Middle East selected a new EHR system for the group.

FUTURE OBJECTIVES

Patients First at Mediclinic

- Implement the standardised doctors' appraisal process across the group.
- Finalise the scope and project plan for the nursing performance management system.
- Expand and implement new clinical indicators across the group.
- Expand the outcome database participation and roll out the obstetrics dashboard.
- Formulate the JCI re-accreditation preparedness plan for all the facilities in the group.
- Update the quality and patient safety strategy for the group.
- Develop a strategy for managing quality indicators (as defined by the regulators) and agree on a quality management framework for the group.
- Align the clinical risk management strategy to the Group.
- Define a clear strategy for the establishment of centres of excellence in the group.

Value-based care

- Finalise the formulation of the clinical strategy for certain key service lines for the group (IVF, metabolic centre, vascular surgery, cosmetics, etc.).
- Continue developing the metabolic surgery service at Mediclinic Airport Road hospital and prepare for the accreditation of the centre.
- Further develop and expand coordinated care initiatives across the group (breast centre, CCC, metabolic centre, etc.).
- Continue the centralisation and consolidation strategy for laboratory services in the group.
- Define a strategy for doctors benchmarking.
- Develop a strategy to centralise radiology services across the group.

Clinical information systems

Mediclinic Middle East will implement the newly selected EHR system across the group as per the agreed project plan.

OVERALL CONCLUSION

The Mediclinic Group has developed a strong focus on clinical performance to ensure efficient, effective and safe patient care of the highest standard. This includes strategic alignment and effective collaboration between divisions. Early indications are that this approach is successful, as illustrated by the positive trends in the report. We believe Mediclinic is well positioned to successfully manage the complexities of private healthcare delivery in the geographic areas in which we operate.

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EPIC number: MDC
LEI: 2138002S5BSBIZTD5I60
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Secondary listing: JSE Limited (share code: MEI)
Secondary listing: Namibian Stock Exchange
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