

Maccabi Healthcare Services delivers coordinated care to over 1.9 million members



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ISRAEL HEALTHCARE (2009)

Total spending
USD 17 billion

Health spending per capita
USD 2,164

Life expectancy at birth
81.6 years

Infant mortality rate
3.8 deaths per 1,000 live births

Obesity rates
13.8 percent (2008)

Israel in the OECD

In 2009, total health spending accounted for 7.9 percent of GDP in Israel (\$17 billion USD), below the average 9.5 percent in OECD countries. While spending per capita has been increasing by 1.5 percent per year on average since 2000, this rate is much lower than the OECD average of 4 percent per year, and this despite the fact that Israel has a fairly high rate of physicians to population - 3.5 practicing physicians per 1,000 population as compared to the OECD average of 3.15.

In line with most OECD countries the number of hospital beds has fallen over time. This coincides with a reduction of average length of stays in hospitals and an increase in the number of surgical procedures performed on a same day basis.

ICT within Israel Healthcare

While, the availability of diagnostic technologies such as the number of computed tomography (CT) scanners and magnetic resonance imaging (MRI) has increased, the number of units in use in Israel lags well below the OECD average. Israel has however, made significant progress in computerizing health records for citizens and health maintenance organizations (HMOs). Israel has overcome both technical and medical informatics challenges to be able to retrieve information from disparate sources and databases and make it available in a way that supports the patient and clinician relationship.

Maccabi within the Israel Health System

Global health systems are finding it increasingly challenging to deal with aging populations and the increased prevalence of chronic disease. The potential for care coordination and alignment of payment incentives to meeting increased need is well documented, however fully realized examples are less readily available.

Maccabi Healthcare Services (Maccabi)

in partnership with physicians, and a foundation of technology investments, delivers a coordinated care solution to over 1.9 million members in Israel (25 percent of the Israeli market).

Maccabi has a yearly income of \$2.6 billion USD. Since 1984, Maccabi has proactively invested in the ongoing development and maintenance of its ICT system.

Maccabi has pioneered connected care by putting in place the coordination necessary amongst health providers to manage all required patient care activities. Maccabi members and physicians benefit from a comprehensive, progressive, fully computerized health system that incorporates:

- ID numbers and demographic information for each member
- Physician visits including diagnoses and treatments
- Medication prescriptions and purchases at Maccabi pharmacies and 700 private pharmacies as well
- Diagnostic procedures and results: laboratory, pathology, genetic lab etc.



- Visits to expert consultation clinics and para-medical centers
- Visits to out-patient hospital clinics
- Hospitalization
- Visits and treatment by supportive and para-medical services such as physiotherapy and occupational therapy

About Maccabi

Maccabi was established in 1941 as an independent, mutual, not-for-profit health insurance fund. Following the passage of the Israeli National Health Insurance Law in 1995, it became an insurance subcontractor and provider of healthcare.

Maccabi is organized into five districts, encompassing 140 branches, which provide both administrative and healthcare services throughout the country. Most of the services are provided by independent contracted providers, at the core of which are 4,000 independent physicians including primary care physicians and specialists. The care they provide is supplemented by 300 senior consultants, who are hospital department heads, 250 diagnostic institutes, 700 private pharmacies and public as well as private hospitals. These contracted services are complemented by over 600 salaried physicians and Maccabi owned services including a centralized laboratory system, a tele-radiology system, telemedicine services (both diagnostic and home monitoring), specialty clinics, a chain of 53 pharmacies and a private hospital network.

MACCABI BY NUMBERS

Maccabi is the second largest health maintenance organization in Israel with 25% of the market share.

- 28.1 million physician visits per year
- 1.7 million prescriptions per month
- 15,000 patients and 40,000 laboratory samples per day
- 16,500 pathology tests per month
- 90,000 X-rays and ultrasound tests per month 200,000 visits to a specialty clinic per month
- 160,000 visit to a hospital outpatient clinic per month
- 18,000 hospitalizations per month
- 95,000 visits and treatments provided by nurses per month
- 53,000 visits by professionals such as physical therapists, dieticians, speech therapists, occupational therapists and psychologists per month
- 1.9 million members
- 5,000 physicians
- 53 pharmacies of Maccabi and 700 private pharmacies in contract with Maccabi

INNOVATION LEADERSHIP

- Ensure vision and decision making
- Ensure clear commitment and involvement of leadership
- Address tangible, practical needs
- Establish a process for implementation and monitoring achievements

PARTNERSHIP AND COLLABORATION

- Establish a multidisciplinary working group, paying attention to include special interest groups
- Establish a joint vision of the health IT system
- Provide financial incentives for physicians
- Establishing an on-going collaborative process
- Ensure benefits for physicians are clear and visible
- Providing training and on-going support to physicians

A Collaborative Approach to Care Coordination

Maccabi's core belief is that all IT investments are business investments that should support strategic priorities and deliver a sustainable advantage to the organization.

Innovative leadership

In 1983, the leadership of Maccabi concluded that the healthcare IT system of the future would require sophisticated information and communication technology for efficient management of the healthcare system, as well as effective and innovative healthcare IT services delivery. Maccabi leadership also recognized the need for top management to be hands-on, solve problems and commit resources to the project. In 1990, implementation of the Electronic Health Records (EHR) system began.

Maccabi invested in health information technology (HIT) even though

there was a lack of empirical and quantitative evidence regarding return on investment, particularly in the area of cost containment.

Establishing a governance structure for the development and management of the IT system was a key success factor in that it provided integrated responsibility and accountability amongst stakeholders.

Clearly identifying concrete needs and goals provided direction to the Maccabi leadership and enabled focus on particular solutions to clinical problems. This process helps to establish standardized workflows and a platform to build on as understanding improves and increased integration of care becomes possible.

A collaborative process

The Maccabi ICT systems are designed to serve independent contractors, doctors and health care providers. Maccabi had to adapt to their needs and work flows instead of expecting them to adapt to the new system Maccabi created.

Maccabi's success in adapting to ICT-based health delivery is based on stimulating and promoting collaboration with strategic partners both nationally and internationally, particularly in the areas of:

- ICT in healthcare
- Managing chronic disease and care of the elderly
- Economic analysis and research
- Telemedicine
- Mobile health

| Maccabi Collaboration Process |
|--|
| 1. Joint physician/Maccabi medical and IT staff committees were established to develop the functional specification needed for each specialty, to oversee the adaptation of the core medical record and to provide on-going feedback during implementation. |
| 2. The physicians defined how they wanted to use the system and it was built to reflect that, for example, the first page a doctor would see when opening the EHR is a summary page with the most relevant patient data. The resulting system is doctor and provider oriented and is more reflective of the way they actually work. |
| 3. A minimum data set was agreed upon with physicians. Over time new fields and tools have been added. |
| 4. In the case of each additional field or tool, the rationale was presented, and the benefits to the doctor, patient and/or organization were clearly delineated. |
| 5. New networking capabilities were systematically developed and each brought with it relevant changes to the EHR for example, with the computerization of the lab came electronic referral to the lab and the ability to electronically transmit lab results directly to the doctor's EHR. |
| 6. The uptake of the EHR was also gradual, beginning with doctors who volunteered to pilot the system. After a successful pilot stage, it was agreed that using the EHR would be voluntary for doctors currently under contract but mandatory for new doctors. This continued until the majority of doctors were in the system, at which point it became a condition of 'doing business' in Maccabi. |
| 7. Incentives were offered to help persuade existing doctors to start using the EHR. For example, the use of the EHR was linked to more rapid processing of claims and earlier payment to doctors. |

Table 1 Maccabi Collaboration Process. Maccabi places collaboration with physicians at the center of realizing changes to work practices and improved business outcomes.

Incentivizing members

To incentivize end users and members, Maccabi issued a health ID card to all its members, to be presented at every point of service, thereby enabling the system to capture all of the members' transactions with the healthcare delivery system.

From 2001 and on, Maccabi patients had access to their own medical information (via kiosks, web portal and mobile devices) – much of what was available to the doctor was made available to the patient including doctor visits, test results, medications prescribed, feedback on risk factors, as well as online guidance for chronic disease management and health promotion.

Maccabi members also benefit from knowing that their complete health record is available wherever they engage with the health system enabling fast and accurate care delivery.

A COMPREHENSIVE HEALTH SYSTEM

- Electronic Medical Record / Electronic Health Record (EMR/ EHR)
- Central Medical Record
- Decision Support Systems
- E-Laboratory
- E-Prescription
- E-Consultation
- Telemedicine, Tele-radiology
- Alerts and Reminders
- Patient Website
- Mobile health

Incentivizing physicians to participate

Successful health IT investments are characterized by the willingness of physicians to engage in new processes and to make changes in the way they work. Clinician barriers such as high initial costs, uncertain financial benefits, investments in time, difficulties with technology and lack of integration with other care services can undermine any health IT initiative. Maccabi addressed these issues by providing incentives for meeting organizational objectives that are embedded into ongoing organizational processes.

One of the reasons that there was such rapid uptake among the doctors was that Maccabi offered financial incentives and simultaneously reduced the financial burden of computerization.

Incentives included a two percent increase in quarterly capitation fees, negotiating significant group discounts on the purchase of hardware, providing interest-free loans for purchasing hardware with convenient repayment conditions, and providing the software at no charge to the physician.

The uptake of the EHR was gradual, beginning with doctors who volunteered to pilot the system. After a successful pilot stage, it was agreed that using the EHR would be voluntary for doctors currently under contract but mandatory for new doctors. This continued until the majority of doctors were in the system, at which point it became a condition of 'doing business' in Maccabi.

Initial Benefits for Physicians

In Maccabi, the physician was able to perceive four benefits within a very short time after implementation:

- The insertion of the member health ID card into the physician's computer automatically populated the screen with the patient's demographic information, saving the physician time in writing or entering the information

- The insertion of the membership card and the validated authentication details of the clinician generated an online connection to the Maccabi database. The clinician could then verify the patient's eligibility to receive services, guaranteeing that the doctor would be paid for the visit
- The initial screen presented the doctor with a summary of the medical information on the patient, including major problems, diagnoses, allergies and medications
- Once the doctor entered a diagnosis for the visit, the information was transmitted and the claims adjudication process was initiated, saving additional entry and paperwork for billing

"As a practicing physician the clinical decision support system enables me to spend my time with the patient more effectively, improve the quality of care and reduce the possibility of error."

Dr. Varda Shalev, independent family physician in Maccabi

Technology Underpins Care Coordination

| Maccabi ICT milestones | |
|------------------------|--|
| 1983 | Decision to move towards a fully computerized organization |
| 1988 - 1994 | Joint decision by Maccabi and its independent physicians' organization to computerize physician's clinics |
| 1989 | Using State I.D. Number as the Maccabi I.D. Number and then introduction of the Membership Card to be used in every point of service |
| 1989 | Computerization of claims management |
| 1989 | Computerizing the prescriptions and the pharmacies - the beginning of the E-prescription era, controlling utilization and costs |
| 1993 & 1997 | Computerization of the laboratories and imaging respectively |
| 1996 | Central Medical Record |
| 2008 | Flexible rules engine to support clinical decision making |
| 2010 | Mobile Health |

Table 2: Maccabi ICT milestones

Approach to coordinated care

Maccabi has a comprehensive, fully integrated health information and communication system with a comprehensive database that includes more than 18 years of data on almost 2 million members. Maccabi functions on the basis of a decentralized organizational approach.

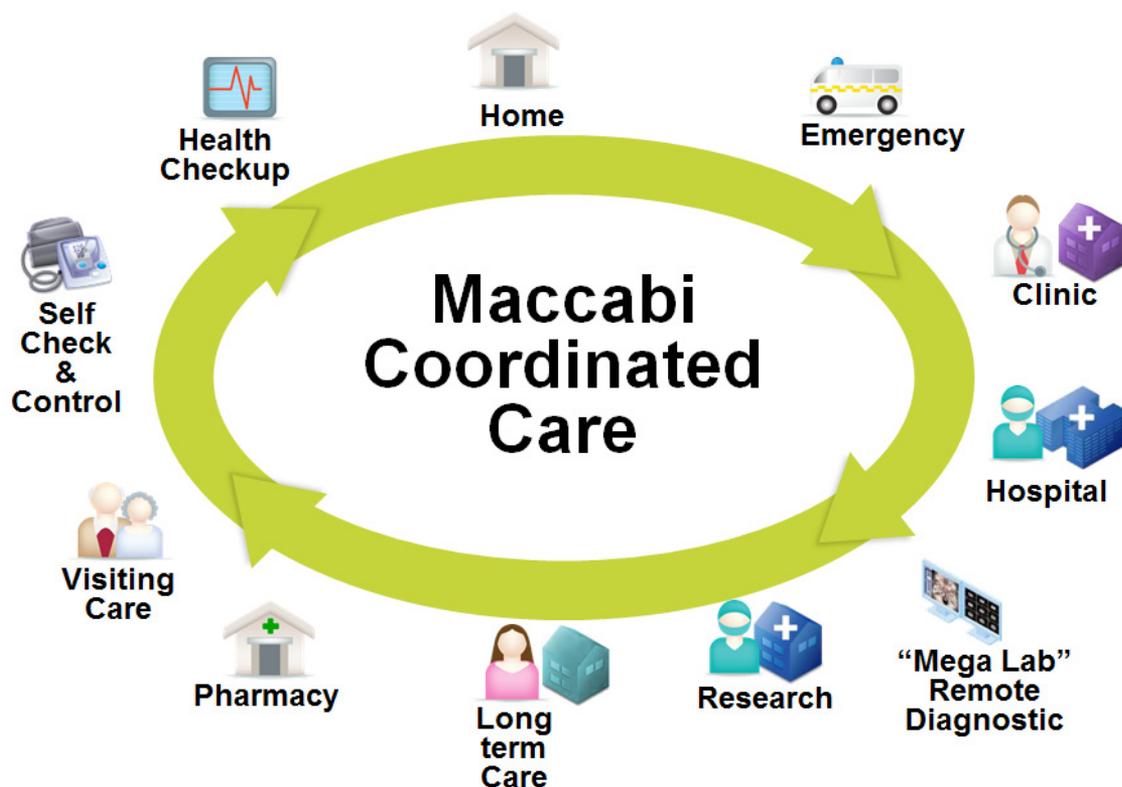


Figure 1: Maccabi coordinated care. Networking and Decision Support Systems are at the heart of delivering coordinated care to Maccabi members.

All healthcare providers use electronic health records and all providers and health services are electronically interconnected online and with continuous clinical data exchange taking place in real time.

At the center of coordinated care delivery is the Maccabi 'Mega Lab', an automated, highly advanced facility where numerous and diverse tests are performed with no human intervention. Test results are transferred directly to the referring physician's computer and recorded in each member's computerized medical record.

The Maccabi IT system now has all of the functionalities for a comprehensive and integrated health delivery system including complete clinical data exchange

among all providers, Electronic Medical Records, outpatient clinical data with computerized physician order entry (CPOE) or referrals, transmission of referral results (test results, consultation results) back to the EMR, clinical guidelines and alerts, e-prescribing (with built-in drug utilization review for contraindications), outpatient practice management (billing, scheduling) and so on, all of which are necessary for meeting the requirements of coordinated care service delivery.

Maccabi had invested heavily in customer relationship support centers, proactive training and updates to physicians sitting in their own clinics, using their own computers, at a time convenient for them

using a combination of online, phone and teleconferencing modalities. Access to patient data is securely protected using encrypted VPN data transfers. A doctor who works with Maccabi is never alone, in using his computerized system.

Technology infrastructure for seamless interoperability

Maccabi systems have been developed to minimize dependency on any particular Electronic Medical Record vendor, enabling relatively seamless integration of new vendors as required.

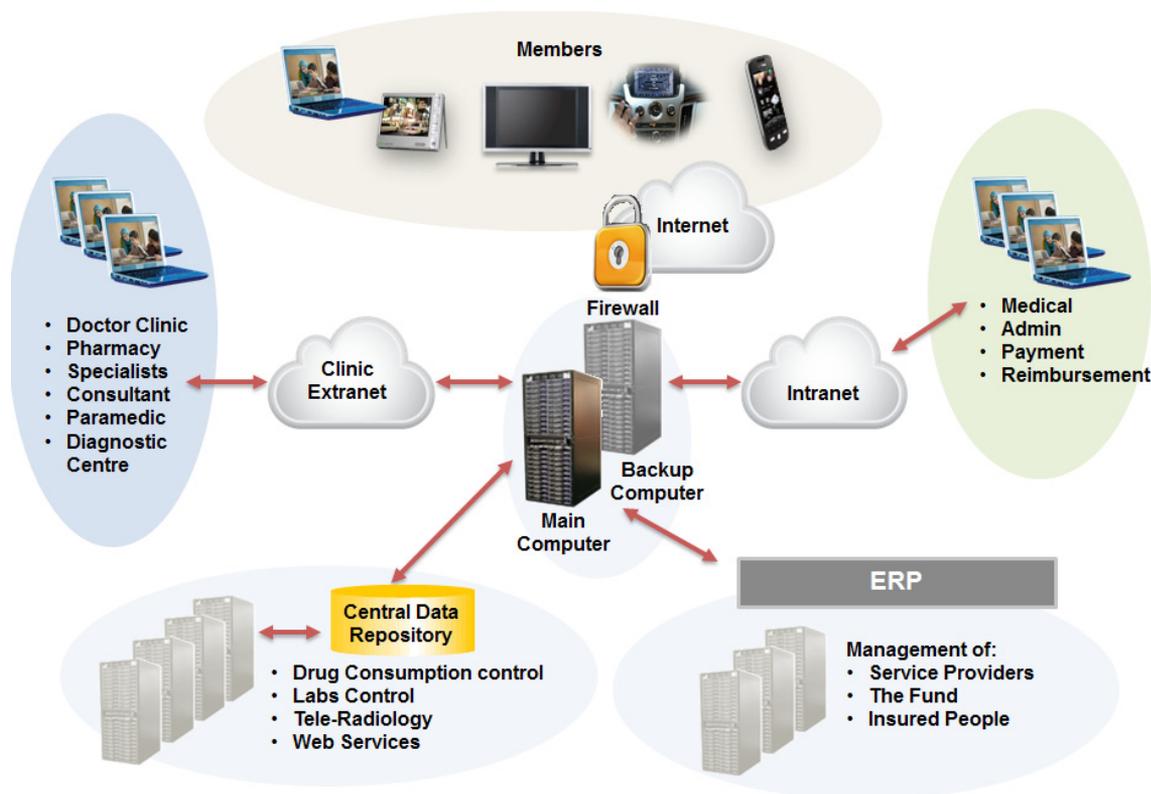


Figure 2: Maccabi Technical Architecture. Members, physicians and Maccabi support staff are interconnected and share data securely over VPN and through firewalls.

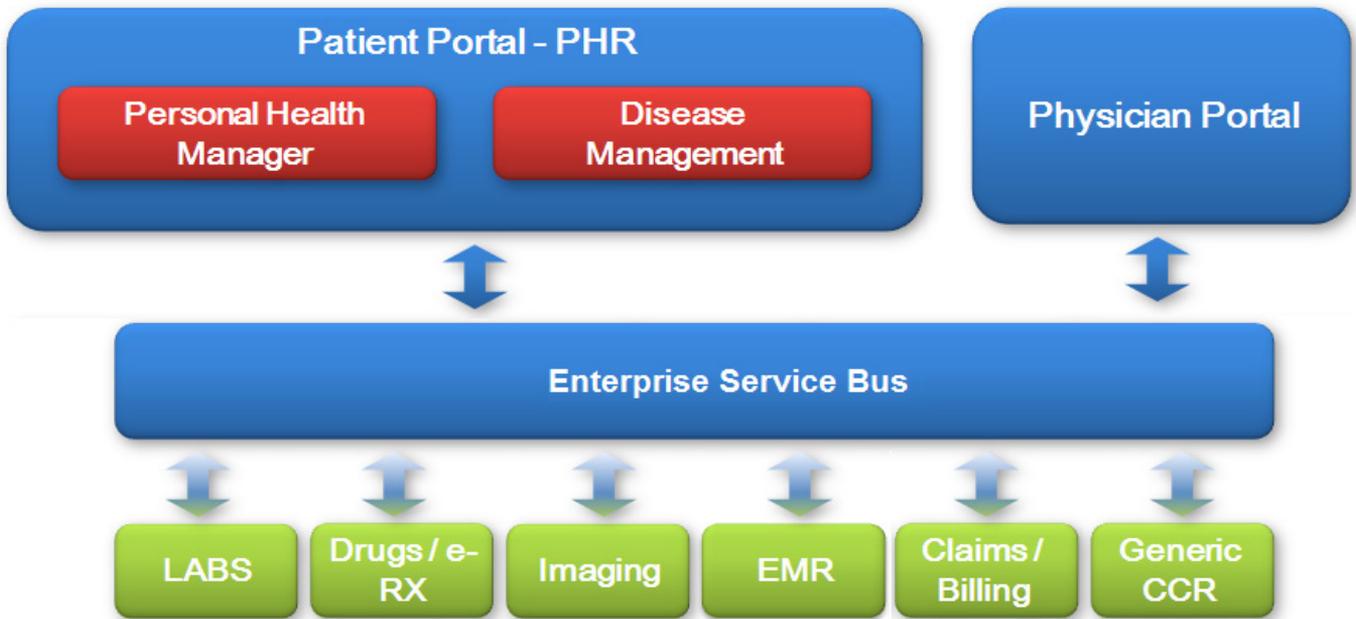


Figure 3: The enterprise service bus enables patient (member) and physician web portals to access clinical data securely.

The major strength of the Maccabi system is the level of connectivity between different technology systems. Maccabi has employed a modular, secured and flexible solution to facilitate a rich and customizable feature list for both members and physicians. The core technological component of this solution is the enterprise service bus that allows the sharing and retrieving of medical data automatically. Built under SOA (Service Oriented Architecture) design principles, the service bus allows lab results, medical imaging, doctors' EMR and other medical information to be transferred using industry standards in many of the implementations.

Web services

Prior to the emergence of web and mobile platforms, Maccabi relied on applications created for client/server platforms. In this model, Maccabi had determined how data and applications should be combined and delivered to client computers and established mature models for optimal distribution and

processing of data. However, as web and mobile platforms have increasingly become more capable of not just consuming but interacting with data, only a Service Oriented Architecture (SOA) was sufficient to start empowering patients and physicians with a richer experience.

Maccabi's transition from client server to web based and cloud architectures is built on a solid foundation of tried and tested business processes coupled with well managed data. Maccabi now delivers applications via web services and a platform that manages security, reliability, scalability and interoperability.

The approach that Maccabi has taken means it is well positioned to take advantage of further technology to further lower the cost of service delivery, while increasing reliability in a secure environment.

Data security in Maccabi

Maccabi has created a high level of data security between its central system and the outside world at the

gateways to the system by of a number of firewalls, including an intrusion prevention system, an application firewall, anti-virus and anti-spam.

Maccabi members access the system via the web and the gateway is protected by SSL-VPN from inappropriate access. The member can only gain access with a user name and password and there are protocols for what information he can access and what he is permitted to enter.

In contrast, the physicians (who are independent contractors in their own private clinics) communicate with Maccabi and access the EMR via dedicated lines (not via the internet).

Maccabi physicians primarily access data remotely and must do so through a Virtual Private Network (VPN). Group policy settings grant access permissions at the user level, significantly decreasing the risk that confidential information will be exposed. Specifically, in addition to user name and password, they cannot access a patient file without swiping the patient's magnetic card or

biometric identification of the patient which is done at the beginning of the visit. An access authorization system permits access for physicians to different levels of information depending on their specialty as well as for other healthcare professionals such as nurses, physical and occupational therapists.

There is also significant data security to protect the system from internal users including employed physicians and other healthcare personnel also using group policy settings that grant access permission at the user level. A security incident management system (SIM) monitors all logs of the systems and does ongoing correlations among the incidents. Any employee who is not a clinician and requires access to the central medical record must submit a request for access to a central committee to be granted limited access on a strictly "need to know" basis.

Maccabi is in the process of implementing the necessary processes to be compliant with security standards in order to obtain ISO 271001 accreditation. The Ministry of Health has issued a regulation requiring all health care organizations in Israel to obtain ISO 27799 approval by 2013.

"Our focus has always been to develop our systems in a way that the Doctor will have a benefit from working with the EHR and get all the data and information he needs at the tip of his fingers. We succeeded because we ensured interoperability between diverse applications and data sources."

Dalia Idar, Head of Clinical Computing, Maccabi Healthcare Services

Security and authentication in the mobile world

As Maccabi extends its client/server business applications to web and cloud platforms, sensitive data is becoming accessible from mobile devices such as smart phones and tablets.

Security concerns on mobile platforms are addressed using the 'thin client approach'. In this approach the entire application flow, UI logic, and validations are developed and processed on the server and virtualized on the browser, while the web browser serves as a "display" for the output and a "receptor" for user input. Only essential UI data is sent to the client, reducing the potential break in and theft of confidential information on the server. Every action that the client wants to take must be authorized by the server first, significantly increasing security.

A significant challenge facing healthcare organizations in moving to more virtual treatment is being able to reliably authenticate the patient. Up to this point physicians could recognize the patient or verify their identity with their Maccabi Card. More recently, Maccabi has introduced biometric authentication based on fingerprints for members.

Maccabi is currently investigating technologies for authentication of members and physicians to access the service by phone. This is through the use of OTP (one time password) methodology for authentication of members and physicians accessing the PHR or EMR via their mobile phone.

Coordinated Care Realizes Clinical and Economic Benefits

Clinical benefits

Over a three year period to 2009, Maccabi achieved the following results:

- 17 percent increase in the number of women above age 50 who had a breast exam with mammography

Despite the very impressive increase in the overall number of patients receiving statin therapy resulting in healthier patients (lowered LDL levels), because of the use of the Maccabi preferred drug, Maccabi actually realized a very significant decrease in drug expenditures for statins. The amount saved, for the years 2004-2006 was \$5 million USD in statin drug expenditures. In addition, due to the improvement in patient outcomes and reduced complications, the average hospital stay for this cohort declined from 0.7 days in 2000 to 0.5 days in 2006. This amounts to 76,000 avoided hospital days with a cost savings of \$32 million USD.

- 17 percent increase in the number of members over 65 who received a pneumovax vaccination
- 13 percent increase in the number of diabetic patients who had a regular HbA1c
- 8 percent increase in the number of diabetic patients whose HbA1c results indicated that the disease was stable

Improved physician prescribing through use of ICT

Maccabi can control the prescribing of drugs centrally, so that physicians are directed to the most cost effective and appropriate drugs. In 2001, medical policy encouraged the use of statin drugs for treatment of high cholesterol. Now when lab results showing high cholesterol arrive electronically in a doctor's computer, the decision support system asks if he wishes to prescribe a statin drug. Maccabi can designate a preferred drug, which the physician is directed towards.

Despite an increase in the number of patients taking statins, the use of the

| Maccabi Cost Savings |
|--|
| 1. Elimination of medical transcription and full computerization of physician notes reducing administration time and increasing time spent on clinical behaviors |
| 2. Real-time access to members health history eliminates searching for paper records and speeds up clinical decision-making |
| 3. Improved prescribing of generic medicines over more costly brand-name medications |
| 4. Elimination of duplicate diagnostic tests and improved lab utilization |
| 5. Diagnostic centers for telemedicine increases efficiency of doctor's time |
| 6. Electronic identification of members in clinics ensuring prompt payment to physicians |
| 7. Reduction in adverse drug interactions |
| 8. Online portals provide preventative care information |

Table 3: Economic benefits. Maccabi has driven cost out of its business through effective use of resources, technology and EHRs.

preferred drug resulted in a decrease in drug expenditures for statins.

The cost saving in expenditures on statin drugs among patients with cardiovascular disease, for 2004 - 2006 alone, was \$5 million USD.

Optimized processes

Financial savings have and continue to be realized primarily through optimized processes that take advantage of shared electronic health records. Less time is spent in administration and more on care delivery.

Physicians have been able to eliminate their use of transcription services, which has contributed substantially to paying for use of the EHR.

Making better clinical decisions

Physicians have been able to make better clinical decisions by having access to a complete patient record. Combined with more preventative care pathways, such as prescribing statins for patients with high cholesterol to reduce its levels, Maccabi has observed that the average hospital stay for cardiovascular patients declined from 0.7 days in 2000-2001 to 0.5 days in 2006; 76,000 avoided hospital days resulted in a total cost saving of \$32 million USD.

Avoiding adverse drug events

One of the most common types of medical error is the adverse drug event. Maccabi's use of ICT and decision support systems has significantly reduced the potential for a patient to have an adverse reaction from being administered an inappropriate medication. For example the laboratory reporting system was modified to provide physician alerts regarding potassium testing. A nightly batch file checked pharmacy diuretic purchases against the patient's potassium blood test status. On-screen computer-generated reminders were sent to physicians of patients lacking a recent potassium test. Reminders to physicians increased potassium testing by 9.8 percent.

As the system has become more sophisticated, more benefits have been realized. For example, in evaluating the effect of online prescription screening in community pharmacies and physician offices for Maccabi, it was found that computerized prescription entry coupled with drug interaction screening software in the community caused a 62.8 percent reduction in pharmacy-dispensed prescriptions with severe drug interactions.

Duplicate lab test

The accuracy of the health record

minimizes waste within Maccabi, for example unnecessary laboratory tests. Prior to the introduction of the health record, physicians would often have an incomplete patient history and consequently may not know what previous diagnoses have been made. Consequently physicians would potentially order inappropriate tests or tests that were unnecessary. When Maccabi introduced the decision support system, it took just two months to observe a 35 percent reduction in ordering of lab tests.

SIGNIFICANT CLINICAL AND ECONOMIC RETURNS FROM ICT INFRASTRUCTURE INVESTMENTS

- Improved physician prescribing through use of ICT
- Optimized processes
- Reducing the length of hospital stays
- Avoiding adverse drug events
- Duplicate lab test
- Covered patients
- Administrative savings
- On-site dispensing

Covered patients

Identifying which patients presenting at clinics are Maccabi patients is important for physicians in order that they can be appropriately reimbursed. By using the magnetic card, it has become simple for physicians to instantly identify the patient and also to access their health record, saving time and ensuring payment.

Administrative savings

Maccabi members have access to their health record online. Maccabi provide web and mobile access to test results, appointments and general information on-demand to members. By enabling members to service their own information needs, Maccabi benefits from reduced administrative costs.

On-site dispensing

The EHR has enabled Maccabi to contract 700 private pharmacies in addition to its own 53, to directly service the needs of its members. Physicians save non-revenue generating time dealing with pharmaceutical issues, such as contra-indications. There is no need to phone or fax inquiries due to illegible handwriting or obtaining authorization for refills. Significant benefits have been realized from on-site dispensing and promoting this to Maccabi members.

Mobilizing and empowering the ecosystem

Kiosks

Maccabi provides kiosks at all of its branches and the major government hospitals. The kiosks increase the accessibility of personal medical information and empower the member. Kiosks provide self-service medical information services similar to those at Maccabi online.

The Maccabi Hotline and customer relations management (CRM) center

Maccabi has established a 24 hour a day, seven days a week call center to provide around the clock services to its members. This consists of information on all services, including who is actually receiving patients at the time of the member’s inquiry, information on member privileges and benefits, making appointments, and telephone consultation with a nurse and/or physician. In order to make this service even more responsive to members’ needs, a new CRM program has been installed, which enables the customer agent to see relevant member information, so that he can provide personally tailored service on the spot. The system also records all encounters. It is also being installed in all of Maccabi’s branch offices and will operate in a totally integrated fashion nationwide. The encounter with the nurse can also occur through video conference.

Smartphone applications

Maccabi members are benefiting from an increasing variety in the ways that they interact with and receive health services. Maccabi has already rolled out smart phone applications that include secure access to personal health records



Figure 4: Maccabi smartphone application

including current and historical lab test results, prescriptions and appointments.

Smart phone users can find doctors, access urgent care centers, pharmacies and branches, receive lab results and pregnancy results as and when required.

| Patient Portal Services | |
|---|--|
| Healthcare | Administrative |
| <ul style="list-style-type: none"> ▪ Physician visits ▪ Laboratory tests ▪ Results of radiology tests ▪ Personal drugs ▪ Diet and nutrition ▪ Cardiac risk ▪ ECG and holter results ▪ Personal recommendations for health promotion ▪ List of vaccinations ▪ Renewal of chronic drugs | <ul style="list-style-type: none"> ▪ Updating personal data ▪ Account status ▪ Scheduling appointments ▪ Ordering drugs from the pharmacy ▪ Registration for supplementary health insurance ▪ Travel insurance |

Table 4: Patient portal services

With these applications Maccabi's customers are able to receive better care by accessing their personal health records at admittance to the hospital.

Maccabi are continuing to develop additional functionality, content and services to provide continuing improvements in care and service to members.

Patient portal self-management

Maccabi has transformed its information system into a tool for patient collaboration, education and communication predominantly via a secured patient internet site that can be accessed by the Maccabi member. The member receives their own unique user name and password which grants access to their own information and provides tools to review medical records, access medical information and receive individual medical feedback. The patient can manage his medical records in this website, can scan documents from other sources and enter measurements he takes himself, such as blood pressure. As a result, the entire health record is in one place.

These computer-based tools and services save members unnecessary trips to Maccabi offices and allow members to perform numerous online activities from their homes, including scheduling appointments, purchasing travel insurance, modifying personal details and automatic billing through members' bank accounts.

Towards the Future

Personal physician program

The Personal Physician Program is an initiative to provide a pro-active approach to patient care. Multi-disciplinary staff and a defined doctor-patient panel are changing the physician-patient encounter using the primary care clinics as the focus for improving quality of medical care and backed by web technologies delivering a one-stop-shop for patient care.

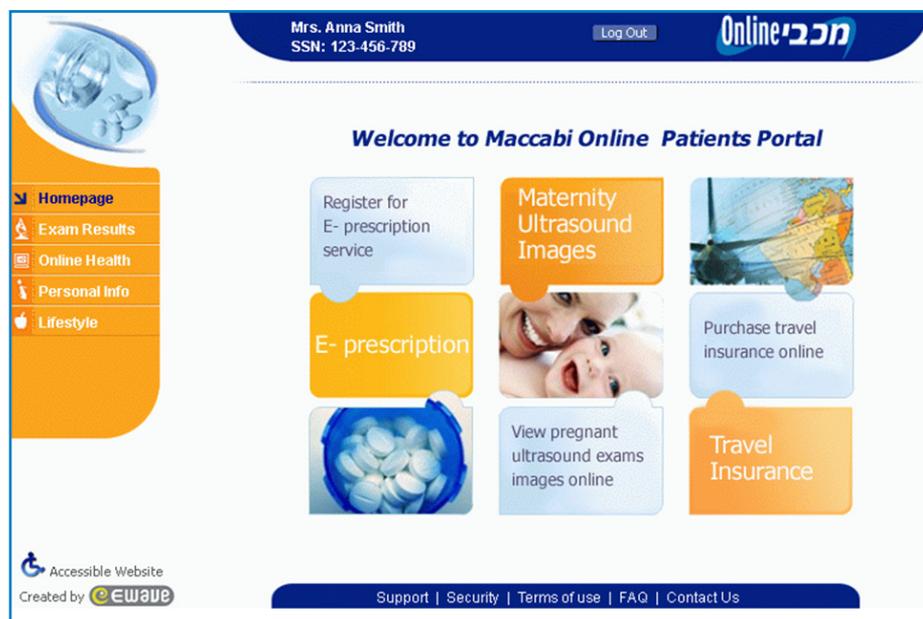


Figure 5: Maccabi patient portal. Members' healthcare needs are delivered through a personalized web interface

Tele-medicine

Telemedicine applications include E.C.G, Ultrasound, Holter, Radiology, Dermatology, Ophthalmology and remote monitoring of CHF patients and patient-provider consultations. Video conferences are coming to the fore in an exploration of how services can be optimally delivered to patients and physicians. A particular area of investigation is alerts for chronic disease management.

Mobile EHR

Maccabi already has patient oriented applications on mobile devices for accessing EHR and another for monitoring pregnancy. The newest major application is to enable mobile access to the EHR for physicians so that they can access records outside of their office at any time and wherever they may be.

Managing patients suffering from Chronic Cardiac Insufficiency

Maccabi has launched a Disease Management Telemedicine System for patients suffering from cardiac insufficiency. The patients, who have

been identified through Maccabi's Cardiovascular Registry, have received digital weight scales, pulse and blood pressure measurement devices which transmit the values on a scheduled basis via telephone lines to a call centre manned by nurses and physicians. In turn they monitor and adjust the patient's medication as well as flagging patients who need immediate medical attention. This service has been operating for four years and Maccabi has decided to extend this system to all patients suffering from chronic diseases including COPD, diabetes and others.

Crisis management health care services

Recent crises have generated a number of new innovations in order to enable Maccabi to continue to provide services to members during times of crisis, for example earthquakes where telecommunications may be disrupted. Maccabi can make available crisis management sub-portals within the main Maccabi sites to provide real-time information regarding doctors who have open clinics and pharmacies

that are dispensing. Maccabi can also identify where members are receiving services, maintain the integrity of the EHR and redeploy resources where they are most needed.

Identifying developing public health crises

Maccabi's sophisticated information and communication system has enabled it to create a real-time surveillance system that can identify emerging outbreaks of health problems. Because computers in all of Maccabi's medical services, (physicians, nurses, laboratory, radiology, etc.) transmit data online on an on-going basis, Maccabi has been able to

develop programmes to analyze, identify and react to developing patterns, such as outbreaks of hepatitis, influenza, pneumonia and other health problems

Maccabi has developed a new 'smart system' to enable the creation of algorithms by the authorized clinical and professional Maccabi staff to trigger alerts, without requiring new programming and hence eliminating reliance on IT technical staff. This will enable Maccabi to flexibly incorporate online alerts as needed and in a timely fashion, into its surveillance system, as well as its disease management and coordinated care systems.

For more about IT Strategies for 21st Century Healthcare, talk to your Intel Digital Health Representative or visit www.intel.com/Assets/PDF/whitepaper/325069.pdf

For more information about Maccabi Healthcare Services, please visit <http://www.maccabi4u.co.il/1837-he/Maccabi.aspx>

For more information about Maccabi Research, please visit <http://www.maccabi-research.org>

For more information on OECD Health Data 2011 for Israel, please visit www.oecd.org/health/healthdata

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