

Developing an integrated information system in the former Yugoslav Republic of Macedonia

Overview

In 2006, the Government of the former Yugoslav Republic of Macedonia launched a strategy to develop an integrated health information system in an effort to streamline information flows and reduce artificially inflated waiting times. Working in partnership with the Health Insurance Fund, the Ministry of Health designed and implemented a web-based appointment platform, coined MyAppointment. General practitioners now register patients for services in MyAppointment,

enabling online tracking of patients to prevent duplicate registration for services, improve accuracy in measuring access and facilitate timely coordination of care. Patients also have access to the platform to monitor appointments and view waiting times. The rollout of MyAppointment was carefully designed to be compatible with existing technological infrastructure. Synergizing with existing infrastructure is credited with accelerating rollout of MyAppointment and minimizing investment costs. Shortly after

the launch of MyAppointment, a reduction in waiting times was observed. Additional features have since been incorporated into the information system, including e-referral and e-prescription applications, and the system continues to evolve under guidance from the new e-health department within the Ministry of Health. Moving forward, focus has been put on using data collected by the information system to guide services delivery improvements at the stewardship level.

Problem definition

In the early 2000s, lack of coordination and standardization in patient registration contributed to long waiting times for health services (Box 1). Patients often registered multiple times in different locations for the same service due to general distrust in the referral system and concerns over long waiting times. Paper-based referrals contributed to inefficiencies, limiting coordination between providers and preventing duplications from being addressed. While government reforms had successfully generated extensive investment in information technology across the health system, these efforts were not systematized, limiting their ability to effectively contribute to optimizing services delivery.

Box 1

What problems did the initiative seek to address?

- Long waiting times for services.
- Lack of coordination and standardization in referral practices.
- Dependence on paper-based referrals and inconsistent use of technology.
- Limited communication between providers.

Health services delivery transformations

Timeline of transformations

In response to increasing patient dissatisfaction coupled with a desire to align with European Union (EU)

recommendations on e-health ahead of potential EU candidacy, the Government of the former Yugoslav Republic of Macedonia led an initiative to develop an integrated electronic information system (Table 1). In 2011, the resulting MyAppointment platform was officially launched and the information system continues to be improved and expanded today.

Description of transformations

Selecting services. Through the use of technology and the MyAppointment platform, the initiative works to ensure that services in the basic benefit package are optimally available and more easily accessible to the public.

Designing care. The new e-referral and MyAppointment application supports streamlined care

Table 1

What were the chronological milestones for the initiative?

2005	General practitioners required to register as private entities with the Health Insurance Fund; online submission of reimbursement requests gradually phased in.
2007	Health Strategy of the Republic of Macedonia: Safe, Efficient and Just Health Care System prioritizes the development of an integrated information system.
2009	Strategy for Development of an Integrated Health Information System launched.
2010	Ministry of Health launches an in-depth scoping investigation into key information challenges; development of information system led by the Ministry of Health.
2011	MyAppointment platform launched; additional applications gradually layered in.
Present	Ongoing expansion and improvement to the information system.

transitions, with general practitioners now able to effectively manage patients' movement through the health system. All referral mechanisms now flow through the MyAppointment platform, enabling improved care planning by both providers and patients.

Organizing providers.

Communication between providers across care levels has improved, facilitated by electronic medical records. Coordinated referrals and reduction in services duplication have reduced waiting times and increased patients' access to providers.

Managing services. The information system has allowed health managers access to real-time patient data, providing insight on service use patterns and helping managers to better organize and distribute

Table 2

How was the delivery of health services transformed through the initiative?

Before	After
Selecting services	
National Health Insurance provides universal coverage; comprehensive benefits package available to population.	Focus on enhancing available services with e-health.
Designing care	
Absence of clear patient referral pathways.	Patient referral pathways clearly defined.
Organizing providers	
Weak gatekeeping ability of general practitioners, with many patients self-referring to specialists; long waiting lists for specialists; lack of communication among providers allows patients to register on multiple waiting lists.	Improved communication and coordination between providers through MyAppointment platform; coordinated referral processes prevent duplicate patient registrations and support gatekeeping role of general practitioners.
Managing services	
General practitioners have access to computers with internet access; lack of real-time service use data for health managers prevents effective organization and management of resources.	MyAppointment platform compatible with existing technological infrastructure; health managers have access to real-time service use data to enable better organization and management of resources.
Improving performance	
No formal training opportunities in e-health available to providers.	Trainings offered to providers to enable effective use of MyAppointment.

resources. Managers are able to study data to identify, for example, popular appointment times, provider demand and prescription patterns. Consequently, managers are now able to make data-driven adaptations to services delivery like increasing the number of providers available at certain times of day, recruiting certain provider profiles and pre-ordering sufficient supplies.

Improving performance.

Trainings were provided to general practitioners and other health professionals to enable effective use of MyAppointment. Since its introduction, the information system has expanded beyond its original objective to provide information to health providers to now also enable managers to use data for planning performance improvements.

Engaging and empowering people, families and communities

A national media campaign was launched to inform the public about MyAppointment and highlight the political prioritization of reducing waiting times. The campaign was designed to emphasize public accountability for respecting the new appointment system to encourage improved adherence to procedures in place.

The Ministry communicated to the public the importance and need to respect the system and the appointments they make. ... In this information campaign it was made clear if you have made an appointment through the system, you should respect this; making people feel liable, that there is a set of rules that they should abide by.

MyAppointment has given patients access to reliable information on waiting times for services across the country. Patients can view information, such as which cities providers are located in, when providers are available and waiting times for services. This publicly available application is “a good tool

in an indirect way for patients to see which providers are particularly busy”. Having access to this information can help patients make decisions about where to seek care and allows them to easily track their appointments.

Health system enabling factors

System-level support for the initiative has been strong (Table 3), with the Ministry of Health guiding efforts through the Strategy for Development of an Integrated Health Information System. During the early phases of the initiative, the Ministry of Health provided assistance to health facilities to improve existing infrastructure and software, easing the transition towards the new system. A new e-health department

has also been created within the Ministry to support continuous development of the information system. As part of the effort to expand the information system, all 33 disease registries are currently being integrated to enable statistical analysis of risk factors at national, regional and local levels. This will support health system planning and the design of targeted, locally adapted interventions. Data collected through the information system will also be used to develop new profiles for health providers who can “support the care processes of patients in a more coordinated way”. Supportive legislative changes are expected to take place to enable further improvements in the coordination of patient care; for example, accrediting nurses to work as care coordinators.

Table 3

How has the health system supported transformations in health services delivery?

System enablers	Example
Accountability	<ul style="list-style-type: none"> Strategy for Development of an Integrated Health Information System guides development of initiative under Ministry of Health oversight. New e-health department created within the Ministry to oversee the initiative and support development of e-health.
Incentives	<ul style="list-style-type: none"> Contracted providers required to electronically submit reimbursement requests to the Health Insurance Fund.
Competencies	<ul style="list-style-type: none"> Necessary conditions being developed to accredit nurses to support care coordination.
Information	<ul style="list-style-type: none"> New information system provides data directly to the Ministry of Health to enable evidence-based health system planning. Ongoing integration of all 33 disease registries into the information system will enable risk analysis at national, regional and local levels.
Innovation	<ul style="list-style-type: none"> Over 3000 applications developed as part of the information system; applications include the MyAppointment platform, e-referral and e-prescription.

Prior to the initiative, the Health Insurance Fund, who is responsible for collecting and allocating funds and contracting providers, transitioned towards electronic reimbursement requests, pushing contracted providers to acquire the necessary technological infrastructure in order to receive reimbursement. The initiative built on this electronic foundation, capitalizing on technological infrastructure investments already made to accelerate uptake of MyAppointment by providers. “It was not an official law or decree that mandated providers to realign their practice, but the conditions really motivated the changes that took place.”

Outcomes

Improvements in waiting times were observed within just a few months of launching MyAppointment, with the effort to improve reporting and monitoring of patient flows generally regarded as being highly successful (Box 2).

Box 2

What were the main outcomes of the initiative?

- Waiting list times dropped from as high as 17 months down to just a few days; the longest waiting times for services are now just two weeks.
- Over 1 500 000 electronic medical records had been created by the end of 2014, covering approximately 75% of the population.¹
- Approximately 20 000 000 electronic prescriptions and over 3 600 000 e-referrals are made annually through the information system.¹

Change management

Key actors

Top-down leadership from the government, in partnership with the Health Insurance Fund and health providers, drove the initiative forward. The Ministry created the overarching action framework and established a new e-health department to support development, management and improvement of the information system. The Ministry worked closely with the Health Insurance Fund to develop the information system and its associated applications. Additionally, the Health Insurance Fund played a key role in promoting providers’ use of the system through contract agreements with general practitioners.

Initiating change

A comprehensive study on health system challenges and information exchanges informed the Strategy for Development of an Integrated Health Information System, helping establish the necessary framework to guide change. Within this Strategy, the Ministry of Health assumed a leadership role over the initiative and carried out a scoping investigation to inform the specific design of the information system. As the Health Insurance Fund had already established links with general practitioners, a partnership was formed between the Ministry of Health and the Health Insurance Fund to design a system compatible with existing infrastructure. Together these partners developed the MyAppointment platform and other applications.

Implementation

The new e-health department within the Ministry of Health provided guidance throughout implementation and helped reduce

the burden of change on providers. Ministry assistance offered to health facilities and providers enabled implementation to progress more rapidly. Assistance included provider trainings on the new information system and regular meetings with general practitioners, academics and other stakeholders to enhance the system’s usability. Capitalizing on existing technological infrastructure supported the implementation process and allowed rapid uptake of the new information system.

This attempt to recycle resources and make use of things already in place was a huge part of the success of this effort. Had it not been done as such, this would have been a huge undertaking, a mess really, taking much more time and resources than was the case. Another three to four years as a minimum.

Moving forward

Recent efforts have focused on ensuring sustainability of the initiative and closing gaps in population registration within the MyAppointment system. The focus moving forward is on finding ways to leverage data collected through the system to inform and support services delivery.

Now is the time to go back and reflect on the changes that have occurred in the past years and strategize how we can make most use of the available data that we now have. ... What this has meant for services delivery and our understanding of population needs. What are the results that the system is showing us? Now is the time to see what we can gain from the system’s insights and use and apply this for further improvements.

Highlights

- Alignment with previous investments in technological infrastructure enabled rapid uptake of the new information system by providers and economical use of existing resources.
- A comprehensive investigation built understanding of problems and supported the development of an informed solution to directly address key challenges.
- An effective communication plan, including public campaigns and efforts to gain public trust, was essential to ensuring successful implementation and uptake of the new information system.

1 Chichevaliev, S. & Milevska-Kostova, N. (2014). *E-Health policy implementation in Macedonia*. Rotterdam: The Erasmus Observatory on Health Law. Retrieved from [http://www.erasmusobservatoryonhealthlaw.nl/Uploads/E-Health%20policy%20implementation%20in%20Macedonia\(1\).pdf](http://www.erasmusobservatoryonhealthlaw.nl/Uploads/E-Health%20policy%20implementation%20in%20Macedonia(1).pdf)