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Development of a National Roadmap for Electronic Prescribing Implementation

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Abstract. Background: In July 2015, Iran Food and Drug Administration convened a multi-stakeholder workgroup (workgroup) to help develop recommendations for electronic prescribing implementation in Iran. Objectives: In general, the consensus of the workgroup was to focus on solutions that incrementally reduce the burden on patients, providers, and payers, and require minimal rework by using national standards that have already been used for Health Information Interchange. We used a road mapping method which includes a number of systematic steps and is adapted from the standard scientific method. Medical Informatics Experts Developed protocols for Scoping Reviews, Systematic reviews and Health Technology Assessment study and then collected evidence from peer-reviewed scholarly journal publications and gray literature. Health Insurance companies representatives and Electronic Prescribing pilot studies executives were asked to report their experiences in the case of e-prescribing. Results: After five meetings, by comparing and contrasting the national and international evidence, the recommendations were finalized in expert panels. In this paper, we report recommendations from this roadmap.

Keywords. electronic prescribing, national roadmap, Iran, implementation, standards

1. Introduction

According to recent scientific evidence, the appropriate electronic prescribing (EP) implementation can be fruitful in patient safety increase and saving costs [1-5]. Therefore, EP implementation is a priority for the Iran Ministry of Health and Medical Education (MOH). In July 2015, Iran Food and Drug Administration (IFDA) convened a multi-stakeholder workgroup (workgroup) to help develop recommendations for EP implementation in Iran.

In general, the consensus of the workgroup was to focus on solutions that incrementally reduce the burden on patients, providers, and payers, and require minimal rework by using national standards already has been used for Health information Interchange (HII).

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2. Methods

2.1. Road mapping

We proceed with a vision-driven road mapping approach in order to derive a plan of actions. We used a road mapping method which includes a number of systematic steps, is adapted from the "standard" scientific method developed by Afsarmanesh et al. [6-8]. However, we adapted their method to customize the steps according to our limitation and preferences. For example, we have dropped the "plan time" step because our stakeholders were not willing to have that. They preferred to only have a roadmap chart in order to characterize inter-liking between the identified actions. Figure 1 shows the method that we have used to develop our roadmap in a step-by-step manner.

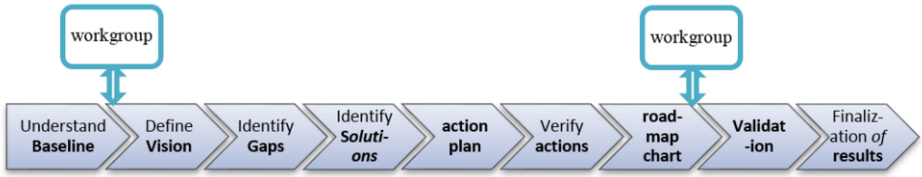

Figure 1. Our road mapping method

2.2. Workgroup members

IFDA called upon the following executives to introduce expert(s): 1. MOH, 2. Medical Council Organization, 3. IFDA Rational Drug Use Committee, 4. Electronic Prescribing Pilot Projects Executives, 5. Main Health Insurance Companies, and 6. Medical Informatics Experts (MIE) from Mashhad University of Medical Sciences.

2.3. International Evidence collection

In accordance with the guidelines of the workgroup, Medical Informatics Experts were asked to find the previous researches, analyze their results, summarize the most important findings, and report the most significant results for the workgroup members. We used Arksey, H. and O'Malley methodology [9] for scoping reviews, Prisma P for systematic reviews [10], and Core HTA [11] for Health Technology Assessment Study [12-13].

MIE collected evidence from peer-reviewed scholarly journal publications by searching in major electronic databases (Medline/PubMed, Embase, Scopus and Google Scholar). A comprehensive gray literature search was conducted to find other national reports, recommendations, standards, and Implementation Guides.

National Committee on Vital and Health Statistics (NCVHS)[2] of the United States of America published a report on recommendations for electronic prescribing in 2005 [6]. To prepare the mentioned report, evidence from the past was gleaned and then reviewed and the gaps of knowledge in this regard were found. After reviewing

[2] The NCVHS serves as the statutory [42 U.S.C. 242k(k)] public advisory body to the Secretary of Health and Human Services (HHS) for health data, statistics, privacy, and national health information policy and the Health Insurance Portability and Accountability Act (HIPAA). website: https://ncvhs.hhs.gov/

evidence MIE suggested this report to be used as the cornerstone. So we focused on the evidence after 2005 and evidence were reviewed up to September 2016. The second milestone was the epSOS Project[3] as an infrastructure for cross-border exchange of Patient Summary and e-prescribing in Europe. A comparative review of electronic prescription systems in five countries (Denmark, Finland, Sweden, England, and the United States of America) [7] has been used.

2.4. National Evidence Collection

Health Insurance Companies representatives and Electronic Prescribing Pilot studies executives were asked to report their experiences in the case of e-prescribing. In a scoping review, published Iranian studies were scrutinized and then they were utilized for recommendations implementation. We used the study results of "Modeling of Outpatient Prescribing Process in Iran" [8] for describing the current situation.

2.5. Expert Panel Meetings

After five meetings, by comparing and contrasting the national and international evidence, the recommendations were finalized in expert panels.

3. Results

The following recommendations are the results of the collaboration of the multi-stakeholder workgroup, which are identified as the needed actions in our proposed roadmap.

1. E-prescribing standards should be comprehensive and suitable for all physicians, pharmacists and it should provide information for insurance companies.
2. The standards should be compatible with other MOH information interchange (HII) standards.
3. Information security and confidentiality should be guaranteed.
4. Backward compatibility of the standards should be mentioned.
5. E-prescribing implementations should support national formulary. National formulary data should be available by web service.
6. Basic e-prescribing functionality should be implemented including:
    a. Creating new prescription
    b. Canceling prescription

[3] epSOS is an eHealth (electronic Health) interoperability project funded by the European Commission. It aims at improving medical treatment of citizens while abroad by providing Healthcare Professionals (HCP) with the necessary electronic and safe patient data This initiative broke new ground and generated a lot of interest in Europe: "When the project was initiated in 2008 it involved a few stakeholders, but it gradually grew to encompass 25 countries and about 50 beneficiaries", project coordinator Fredrik Lindén (Sweden) and his team write in their letter (http://epsos.eu/fileadmin/content/pdf/deliverables/epSOS_letter_to_contributors_1July2014.pdf).

"The epSOS project achieved considerable results in a range of areas. Main technical deliverables include development of a solid basis for the eprescription and patient summary services, considering: governance, use cases, data content, semantics, specifications, architecture, testing mechanisms, etc.". website: http://www.epsos.eu/

   c. Refilling prescription
   d. Revising prescription according to pharmacist consultation
   e. Patient medication history should be accessible for the prescription provider.
   f. Supporting prior authorization (prior authorization is done by pharmacies in Iran)
   g. Providing medication delivery feedback for physician
7. To guarantee the security standards the following infrastructures are mandatory: secure health information interchange network, digital signature, and PKI service.
8. Support of health ID card should be mentioned.
9. Prescription delivery should be possible from a pharmacy which is not connected to the e-prescribing network. (e.g. by health card or printed prescription)
10. Clinical workflow must be supported in network instability.
11. E-prescribing should support clinical workflow in offices, and pharmacies.
12. E-prescribing implementation should support claims data.
13. Information processes and data analyses should be planned from the first step.
14. A mapping between different coding standards should be mentioned.
15. Medication availability in the country or mentioned pharmacy should be observed while prescribing.
16. Vivid regulations should be observed for alternative medications delivery by pharmacists.
17. The standard format of the prescription should be observed.
18. Evidence shows that decision support system reduce medical errors; therefore, it is recommended the e-prescribing system to be equipped with decision support systems. The following DSSs in e-prescribing are recommended:
   a. Access to clinical guidelines,
   b. Notification to drug allergy,
   c. Drug dose calculation,
   d. Order set recommendation,
   e. Providing feedback based on national average drug use,
   f. Suggestion for cheaper alternative drugs
19. Knowledge-base using in decision support system should be supervised and guaranteed to be updated.
20. Patient, provider and pharmacist identification standards should be implemented across the country.
21. E-prescribing should support the care of non-citizens, in this case, passport number can be used for patient identification.
22. The identification code for office, pharmacy, Hospitals, Clinics (Health care Centers), insurance plan should be provided.
23. The process of license issue for e-prescribing solutions should be implemented.
24. Incentive considerations for the pharmacies or physicians using e-prescribing.
25. E-prescribing should be integrated with EHR systems.
26. Free text field should be available for special cases.

27. Patient preference including order language should be mentioned.
28. The alternative plan should be available in crises.

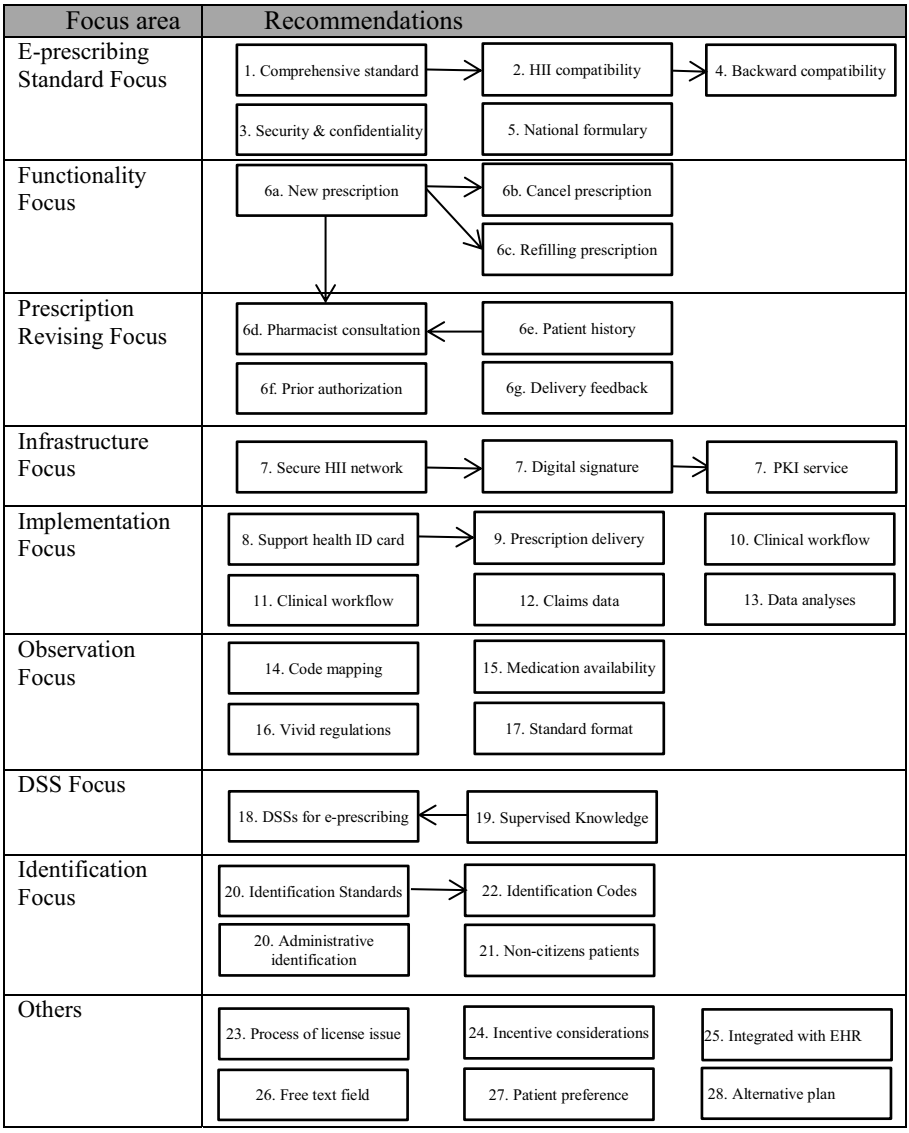

Figure 2. The proposed road map chart

According to the 7th step of the method (see Figure 1), these actions are summarized and represented in the form of a roadmap chart. Our results are categorized into 7 different focus areas. The transitions the actions reveal a time-based dependency or priority between some of the actions. Figure 2 shows the proposed roadmap chart.

4. Discussion

E-prescribing was implemented in developed countries such as Sweden from 1980s [9]. Over the years, the reasons for success and failure of e-prescribing have been investigated. Although, systematic reviews and meta-analyses showed that the e-prescribing implementation can reduce medical errors and save cost but the context of the national health model influence on development and adoption of Electronic Prescribing.

Although most of the evidence is transferable and we must learn lessons from experiences in other countries but the recommendations from one country should not be used before customization in another country.

A few National level road-maps for digitalization of health care are published [18]. Most of them are based on the expert meeting but we collect evidence by scoping and systematic reviews, interview with semi structured questionnaire and a Health Technology Assessment study to support expert panel. This method led us to some specific recommendations. Because of the noticeable number of tourists and immigrants in Iran that they don't have Health ID we recommended to use passport number for the identification process. We noticed that herbal and traditional medicines are important in Iran so we recommended EP systems must support them and free text field should be available for special cases. Catastrophic disasters have occurred in Iran; therefore, we recommended having an alternative plan in a crisis. People in different languages live in Iran; therefore, we recommended EP systems must support multilanguage drug order.

We published our method and results hoping our experience be useful for other countries. We also hope to get feedback from scholars to update the recommendations. We have planned to publish supplementary studies and explanation of recommendation items as soon as possible.

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