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# Contextualizing Online Laboratory (lab) Results and Mapping the Patient Journey

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Abstract. The 21st century has brought forth unprecedented technological advances, such as the advent of portable digital devices [1]. This trend has also permeated the health care sector, with the introduction of digital health services, like providing citizens with access to their online laboratory (lab) results. This qualitative study will illustrate the patient journey, namely participant 16 (P16), to address the research question: what phases does a person go through when accessing their lab results online? The findings revealed that lab results were accessed from two types of devices a tablet (e.g., portable computer) when at home and a mobile phone when away from home. We also found that interpretation of results can be a challenge and it was unclear if P16 was able to understand her lab results. To illustrate the complexity of interpreting and accessing online lab results, the authors created a Customer Journey Map to contextualize the experiences of P16. The journey map depicts a combination of factors such as: eHealth literacy, limited access to providers, difficulty interpreting lab test results. Additionally, recommendations for online lab portal functionality enhancements were discovered through the mapping exercise. This study demonstrated that along with providing citizens with access to digital health technologies and services, considerations to eHealth literacy, the digital divide and health equity are paramount. As evidenced by the visualization, journey maps hold promise to serve as efficient tools to build empathy and identify the unique needs and perspectives of citizens.

Keywords. Health literacy, digital divide, patient journey map, health informatics

### 1. Introduction

The 21<sup>st</sup> century has brought forth unprecedented technological advances, in particular the advent of portable digital devices and services, connecting citizens globally through a network of broadband and satellite technologies [1]. These innovations have also permeated the health care sector, with digital tools such as personal health records (PHRs) providing patients (i.e., citizens, health consumers, laypersons [3]) with access to their personal health information. These new technologies present opportunities for patient empowerment and shared decision making (SDM) [5]. However, to create value, these systems must align with the needs and capabilities of the patients they serve [6]. Therefore, in conjunction with the features and readily available data that digital health tools offer, it is imperative to understand the context in which they will be accessed, used, and interpreted along the patient journey [7]. Merely, providing citizens with access to

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their health information does not guarantee comprehension [8] or equitable distribution of health services. Further, the broad expansion of technologies can exacerbate health care disparities (i.e., reduce health equity) by offering more services to those who are already better positioned, while leaving behind people without adequate infrastructure (i.e., no access) or that do not have the knowledge or desire to use technology [9].

Additionally, considerations should be made to digital (i.e., eHealth) literacy "the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" [10]. It is vital to view citizens (e.g., patients, caregivers) as seekers of knowledge, navigating a personal journey across the care continuum. Moreover, these knowledge seekers have unique health care needs, abilities, and perspectives. Additionally, organizational health literacy plays a role in the patient journey, as it is "the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others" [11]. Therefore, several factors must be considered when providing citizens with access to digital health tools, such as online laboratory (lab) results. Thus, the objective of this study is to illustrate the patient journey of participant 16 (P16) by addressing the research question: what phases does a person go through when accessing their lab results online?

#### 2. Methods

This qualitative study was approved by the University of Victoria's Human Research Ethics Board and is part of an exploratory series of studies investigating patterns and trends of Canadians who access their lab results online [2-4]. Specifically, this study focused on the lived experiences of P16 in accessing her lab results online. Therefore, to illustrate the patient journey [7] in accessing online lab results, the authors created a Customer Journey Map [7], based on P16's interview responses (Figure 1). As the intent of a Customer Journey Maps is to examine the relationship between individuals and a specific product or service [7], it was an appropriate journey mapping technique for this exercise. As such direct quotes are embedded in the visualization from the following subset of interview questions: 1) Usually, when you look at your online lab results where are you (e.g., at home, at work, on a bus, in a clinic)? 2) What do you use to look at them (e.g., mobile phone, tablet, desktop, or laptop computer)? 3) Do you understand what your online lab results mean?

#### 3. Results

Some demographic details include that P16 was between 65-74 years old, primarily spoke English at home, and had one or more chronic illnesses [2-4]. Result from the first question about where online lab results were accessed, revealed that P16 primarily accessed her results at home. When inquiring about what device(s) P16 used to view her lab results, a tablet (i.e., portable computer) and mobile phone were the preferred devices. Lastly, in exploring comprehension when asked "do you understand your results," P16 replied "yes," but also added the caveat "generally, I mean, between me and Dr. Google, we usually figure it out." Therefore, it was unclear if P16 was able to understand her results. The complexity of interpreting, accessing online lab results and P16's patient

journey is illustrated (Figure 1). Additionally, portal functionality enhancements, based on P16's experiences were revealed by the mapping activity.



Figure 1. Customer Journey Map

#### 4. Discussion and Conclusions

This qualitative study depicted the challenges and nuances of providing a citizen with access to her online lab results. The direct quotes illustrated in the Customer Journey Map (Figure 1) provide insight into the phases, lived experiences and challenges faced by P16 in accessing her lab results online. Additionally, P16 preferred accessing her lab results at home via tablet or on her mobile phone when not at home. Further, despite having technological competencies and familiarity in accessing online lab results for over 4 years, the findings revealed that P16 found the interpretation of her results challenging. This study has several limitations, for example, P16 is a Canadian born, high school educated female with demonstrated technological capabilities. Therefore, P16 did not reflect the true diversity of the Canadian population or the varying technical competencies of the Canadian market. Moreover, the implications of eHealth literacy, organizational health literacy and the digital divide were not fully realized or captured in the findings. Additionally, interpretive discrepancies between individuals with differing competencies using complex technologies (i.e., online lab portals) were not quantified [6]. Further, as P16 has one or more chronic health conditions and only accesses her lab results a few times a year, her lived experiences may not mirror those of other individuals. Moreover, implications of user experience (UX) and system design [4] were also not fully expressed in the study.

To illustrate the experiences and challenges faced by P16 in accessing and interpreting online lab results, the authors presented an application of a Customer Journey Map (Figure 1). Additionally, recommendations for portal functionality enhancements, were discovered through the mapping exercise. As the Customer Journey Map technique, visually identifies the experiences faced by individuals when interacting with a specific product or service (i.e., online portal to access their lab results) [7], it was easy to identify the pain points of P16 in accessing and interpreting lab results online. Additionally, the visualization succinctly details several combined factors and implications such as: health literacy, limited access to providers, difficulty interpreting lab test results. As evidenced by the visualization, journey maps hold promise to serve as efficient tools to build empathy and identify the unique needs and perspectives of citizens. Therefore, although this study was specific to one citizen, the journey map concept could be modified and used to synthesize common issues experienced by multiple citizens. This study revealed that providing citizens with access to their test results via portals offers some value, but these systems may not meet their diverse needs [8]. Therefore, with the advent of digital health technologies and services, considerations to eHealth literacy, the digital divide and health equity are paramount. Consequently, a dynamic evaluative approach to the design of digital health tools could ensure that safe and usable technologies are procured and used in health care contexts [12].

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