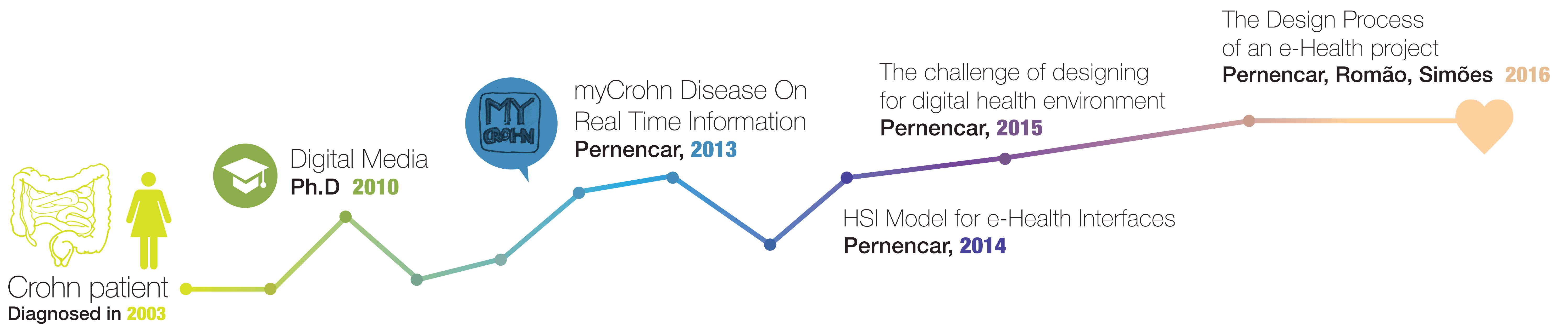# m-Health *Iterative Design Process*

## Applying the HSI framework for interface analysis

Cláudia Pernencar
claudiapernencar@me.com

Supervisor: FCSH.UNL – Graça Simões, Ph.D
Co-Supervisor: FCT.UNL – Teresa Romão, Ph.D

The Design Process
of an e-Health project
**Pernencar, Romão, Simões** **2016**

The challenge of designing
for digital health environment
**Pernencar, 2015**

myCrohn Disease On
Real Time Information
**Pernencar, 2013**

Digital Media
**Ph.D 2010**

Crohn patient
**Diagnosed in 2003**

HSI Model for e-Health Interfaces
**Pernencar, 2014**

---

## Abstract & Keywords

This poster presents three studies. **A survey to study patients routines**; An **empirical study about the purpose of Universal Design Principles** [1] in interface design of six IBD mobile phone applications; **A/B tests to compare the interface design details and functionalities** from two of the six IBD systems previously analysed, as a part of the design process of **"myCrohn"** [2] project that followed HSI framework – **"Human-Social Interaction Model for e-Health Interfaces"** [3].

**Design process • e-Health • Human-Social Interaction • IBD • User-Centered Design**

## Related work

The scenario of **"User Innovators"** involves **"myCrohn"** [2] project context, which emerged from an outcome as both **patient** and **designer**. HSI framework [3] helped to scientifically validate the use of **personal experience** during the **Design Process**.

PERNENCAR
User Designer
User Innovator
User Patient

### HSI framework contribution

- Interaction design experience as a designer in how to wireframe an interactive idea,;How to conduct usability tests and how to create new experiences through softwareapplications;
- Present some novel health solution in design context;
- Experience related to a chronic disease in order to identify opportunities and promotes shared understanding.

### Inflammatory Bowel Disease (IBD) [4]

Involves chronic inflammation of all or part of your digestive tract. Includes **Ulcerative Colitis** and **Crohn's disease** and both usually involve severe diarrhea, pain, fatigue and weight loss.

86.000/100.000

146.000/100.000

73 new cases 100.000

43 new cases 100.000

2003   2007
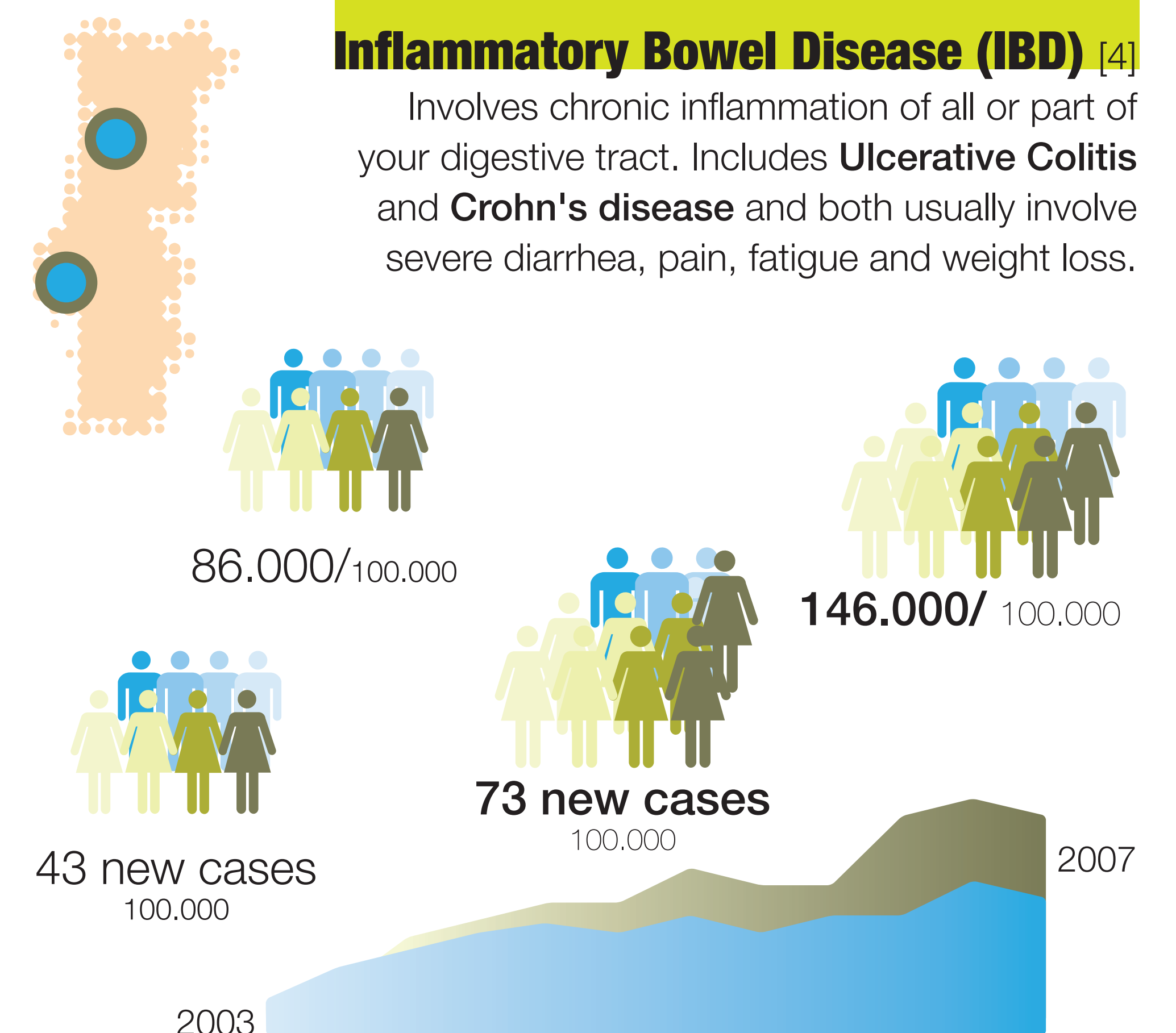
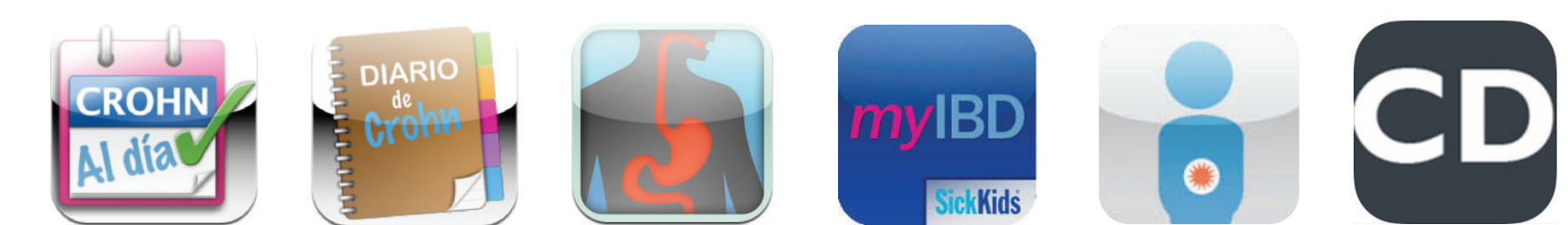| HSI framework | Preview benefits | Contexts |
|---|---|---|
| User Patient | Identifies opportunities; Promotes shared understanding. | The scenarios created to patient survey will be based on personal situations. |
| User Designer | Helps to understand the context; Manages project resources. | |
| User Patient | Facilitates comparison between systems; Promotes shared understanding; Brings new perspectives. | The case studies will be analysed under personal perspective as a patient and as a professional (interface designer). |
| User Designer | Give focus to design process; Defines directions; Help in understanding the best practices; Identifies challenges. | |

## Design process

### 1st stage – IBD patient survey

- Medication record in digital environment wasn't a common behavior for the majority. For daily routine, 90% were enrolled;
- 85% said not use mobile phone to record daily registrations medications. This result reflects that for a daily routine with a fixed schedule, the task mentioned it is not a priority;
- 39% use mobile phone as a tool to manage personal routines related to receiving information on paper, after a medical appointment. Those who said to use a registration of "Date/ time of the next appointment" are who carry the disease for more than five years and less than ten.

This study allows us to understand that the applications audience does not have their routines so well systematized to use mobile phone as a tool to monitor their disease.

### 3rd stage – A/B testing case studies



- "myIBD" [5] launchpad has symbols represented with a clear iconic illustration and a correct application of the color theory. The consistency detected on the first page was not preserved throughout the application. In the second navigation, presented a complex iconic representation for almost features;
- The menu list of "GI Buddy" [6] supported by a footer with tabs presented traditional sign systems that were easy to understand. The dificulty with visual interpretation it came when tasks requested passed to the second screen.

Using nonstandrad sign systems can cause misunderstood.

### 2nd stage – Interfaces case studies analysis



- Traditional m-Health applications still requires users to manually register the majority of data. The most abstract situation in that context, is the subjective way – due to the abstract level of iconic representation – users record data in the systems (e.g., using a scale from 0 to 10 to measure the "Pain" level represented only by icons without any textual indication to support a better comprehension of what does it mean).

Interactive communication strategies have to change. Traditional methodologies are awfully generalist for m-Health Design. The perspective as a "User Patient" when analyzing the case studies says that is important to collect data as much as possible, but patients are not so pro-active to their diseases.

## Conclusions

Traditional methods of recording medical data will not be part of the device's user experience in the future, especially in chronic diseases. We believe in patients' responsibility in personal data registration and the use of sensors for automatic registration of their medical and bio-medical data.

**References**
[1] W. Lidwell, K. Holden, and J. Butler, Universal Principles of Design. Rockport Publishers, Inc., 2003;
[2] C. Pernencar, "My Crohn's diease on real time information," in IEEE, 2013, pp. 1–7. doi:10.1109/SeGAH.2013.6665304;
[3] C. Pernencar, "Human-Social Interaction model for e-health interfaces," in Advances in Ergonomics In Design, Usability & Special Populations, vol. Design and Human Behavior II, Section 11 vóls., AHFE Conference 2014, 2014, pp. 555–56;
[4] F. Magro, L. Correia, P. Lago, G. Macedo, P. Peixe, F. Portela, J. Amil Dias, and L. Barros, "Decisões clínicas na doença de Crohn," J. Port. Gastrenterologia, vol. 19, no. 2, pp. 71–88, 2012;
[5] SickKids, "myIBD," 2011. [Online]. Available: https://itunes.apple.com/us/app/myibd/id444728980. [Accessed: 11-Dec-2015];
[6] "GI Buddy," App Store. [Online]. Available: https://itunes.apple.com/us/app/gibuddy/id579320415?mt=8. [Accessed: 09-Mar-2015].