A survey on the current trends on home-based, e-healthcare systems. ¿The future of healthcare?

The example of a merging model: The *TI-Health system*

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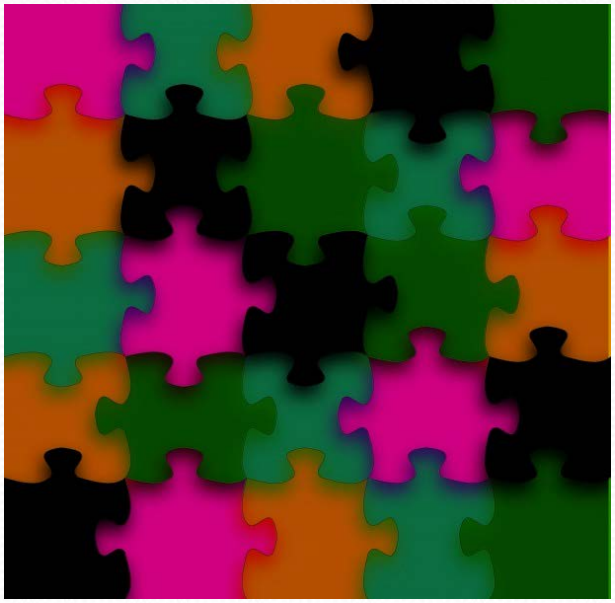
Home-based and e-healthcare management systems try to overcome well-know limitations of traditional healthcare models that fall short on early detection and prevention of deseases, and on the optimal use of all formal and informal resources around the patient in their home and community.

The *TI-Health* system is intended to offer an overarching solution by taking and merging the best of the latest trends.



TI-Health (Time-Integrated) system “assembles” current healthcare trends and practices such as:

- *Early diagnosis and prevention, facilitated by new ICT tools;*
- *Personalized medicine, patient-centered, home and community-based management models;*
- *Health promotion*, *centered on the patient´s personal and social resources;*
- *Genetic, psycho-social and real-time physiological predictive tools;*
- *Integrated healthcare models:*
  - *Healthcare e-governance*
  - *Self-management health*
  - *Palliative care.*
  - *Shared care*

Target groups

The proposed *TI-Health* system is especially focused on the most frequent types of chronic diseases developing into serious dependency in the aging population, with complex, multidimensional problems needing an overarching approach.

System design

The system is built based on 2 grounds:

(1) a Time-Based ICT system

2) A home-based, community-centred e-governance healthcare

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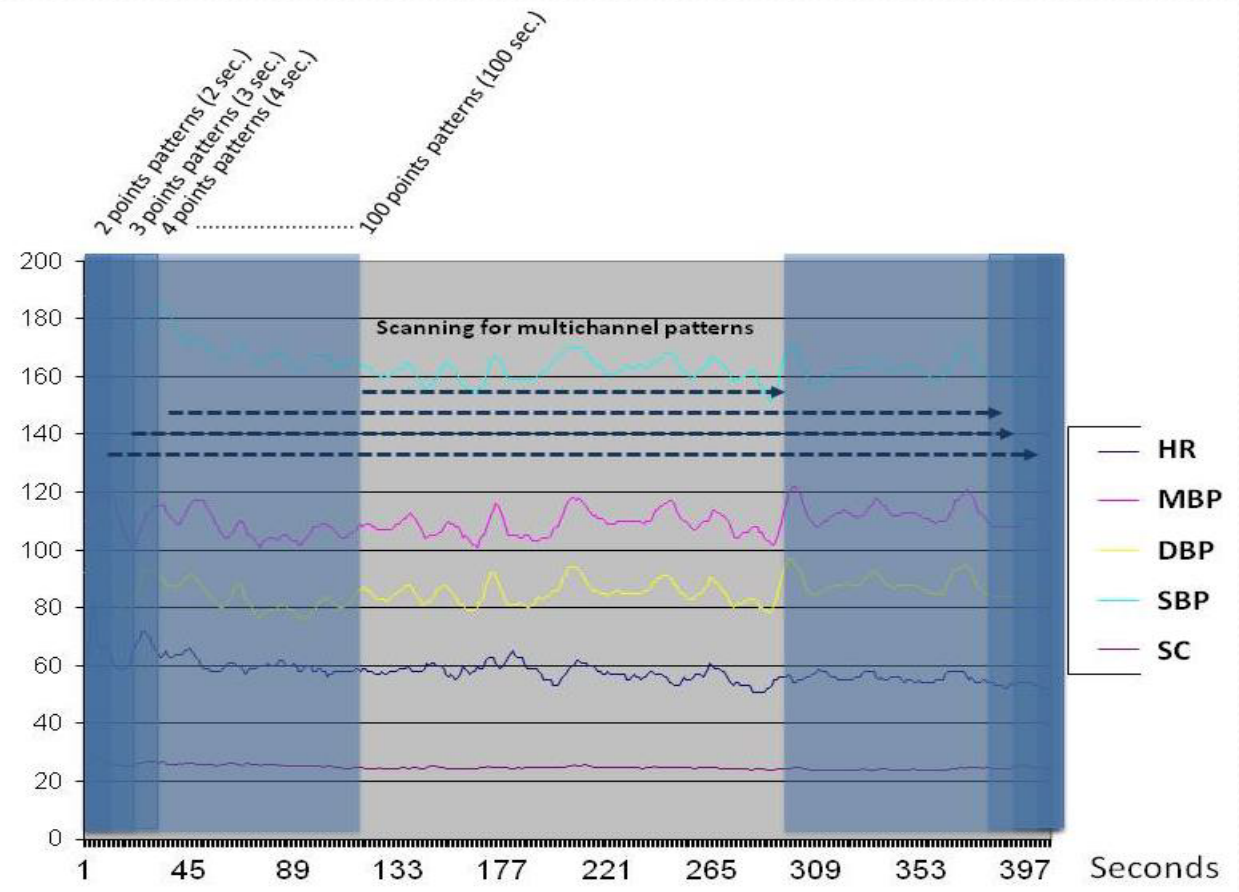
1. A time-based integrated methodology

Bio-Psycho-Social data prediction

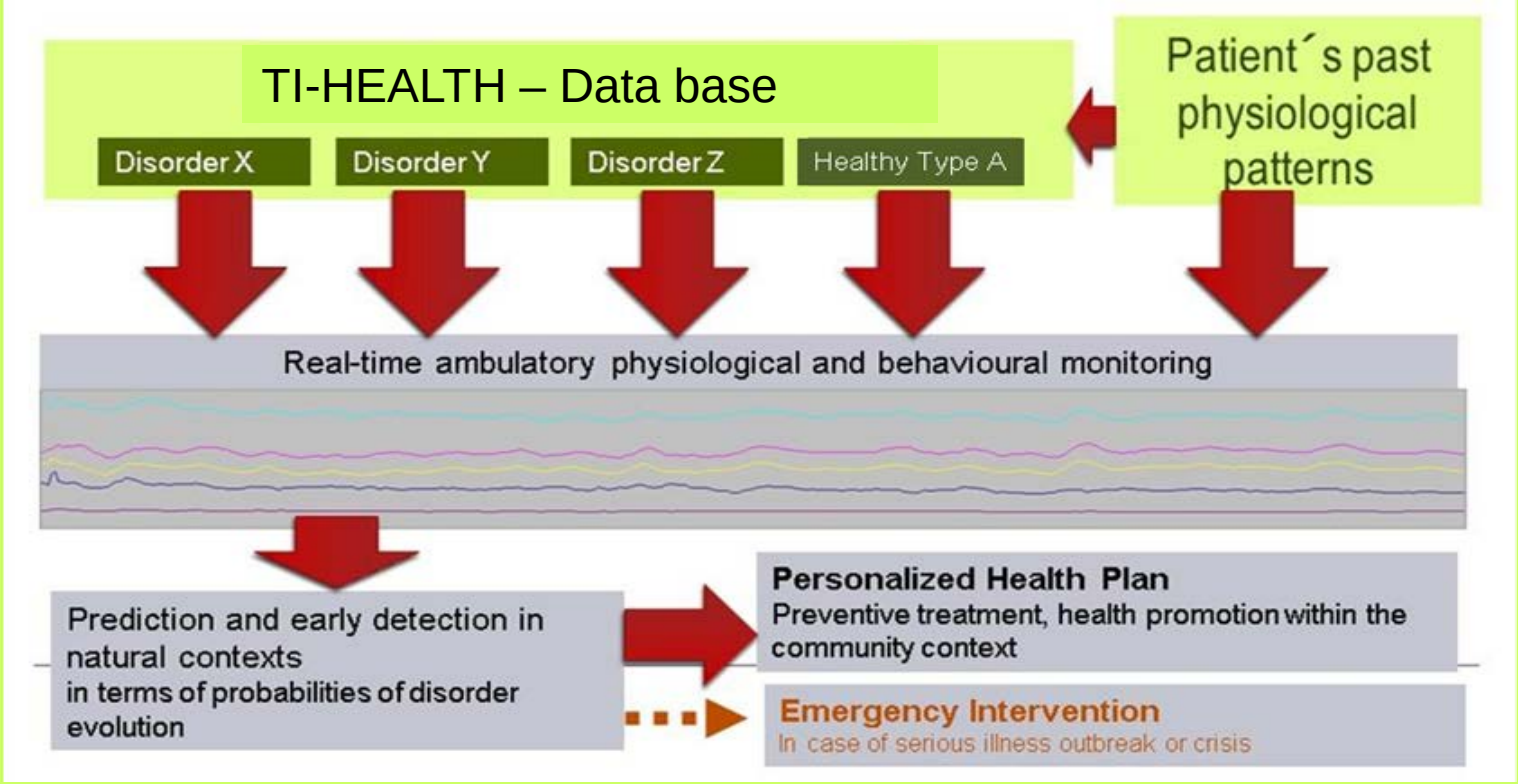
The use of machine-learning procedures will continuously improve previous multi-physiological time patterns that best predict posterior time pattens in real time using non-invasive sensors.



Classification process of self-predicting physiological patterns

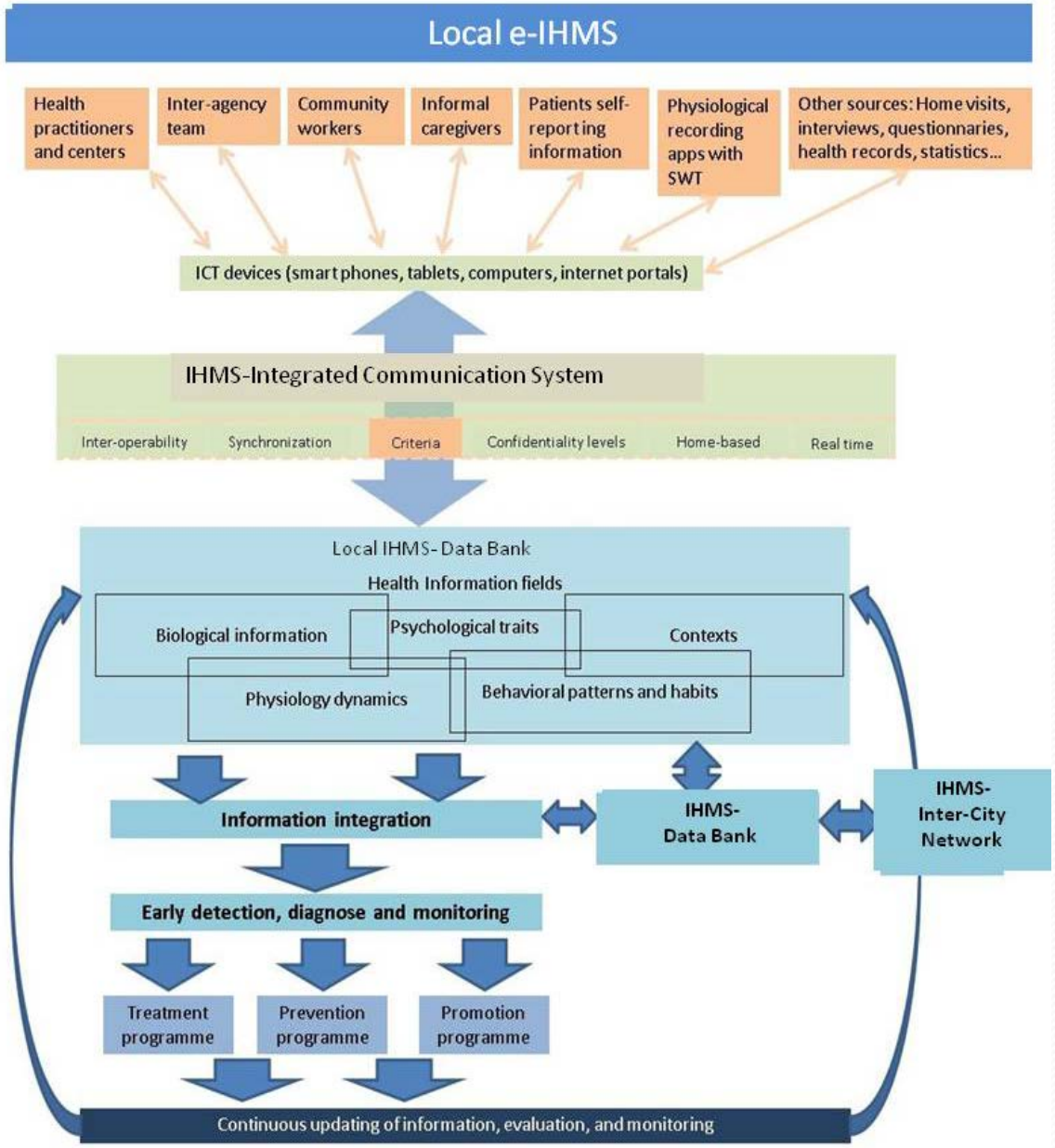
The best predicting physiological patterns will be integrated with psychological, behavioural and social relevant variables to generate profiles. These profiles will be compared to “analogues” from the own patient and from patients with different diseases in different stages of the illness (based on a big-data base).

The comparisons will indicate the degree of similarities of the patient´s profiles with those of different illnesses and with the evolution of the own patient to provide predictive information. Through increasing the data base with new data, the machine-learning procedures will continuously improve the predictive capacity of the system.



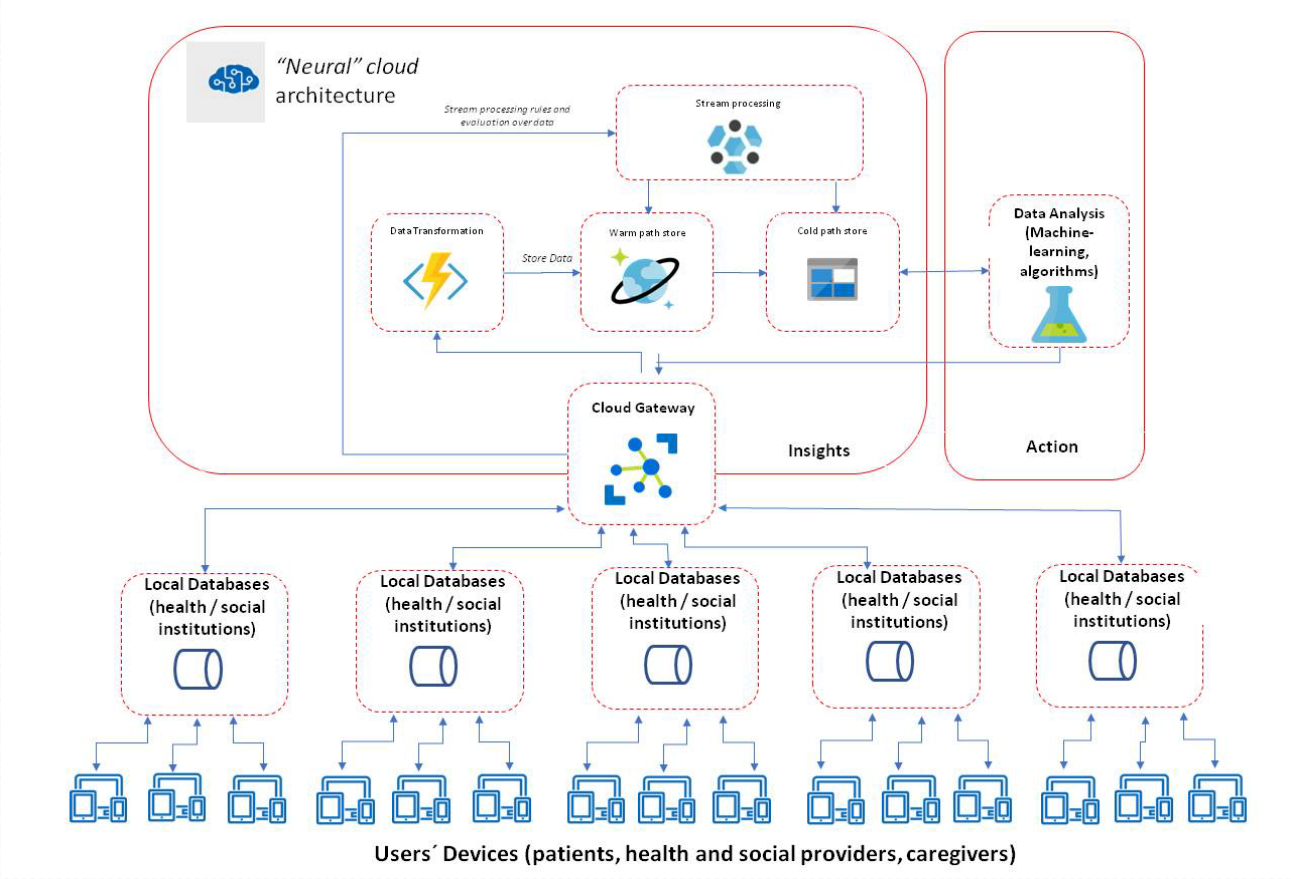
ICT tools for health information governance and management.

Only the ICT tools will be used to gather just the needed information of each agency, reducing confidential information from the user to the one needed by each agency.



Distributed data processing and protection

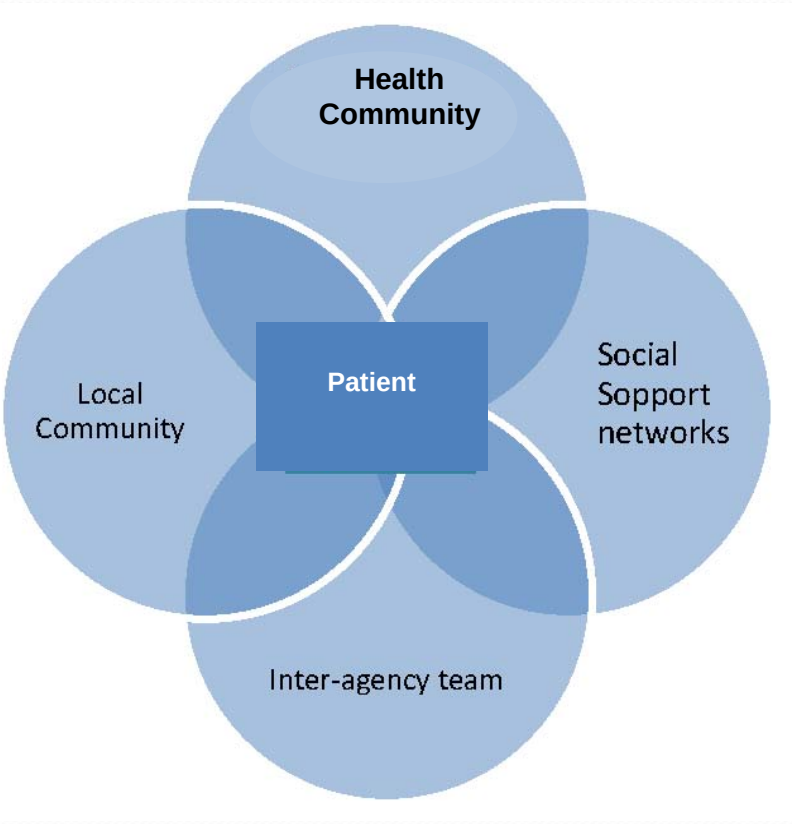
A main strategy will be implemented maintaining the distribution of information fields in the servers of the different agencies who are entitle to have that information. This requires management of confidentiality with access only to specific fields to each agency depending on those required or needed by the services, agencies, and users.



The healthcare system is based on cloud platforms solutions for data protection. The system may keep a "neural architecture", using the brain simile, with the data distributed in the institutions in charge of safeguarding the data while using the cloud for data analysis (figure adapted to this project from an initial Azure figure, Microsoft, courtesy of Nextret)

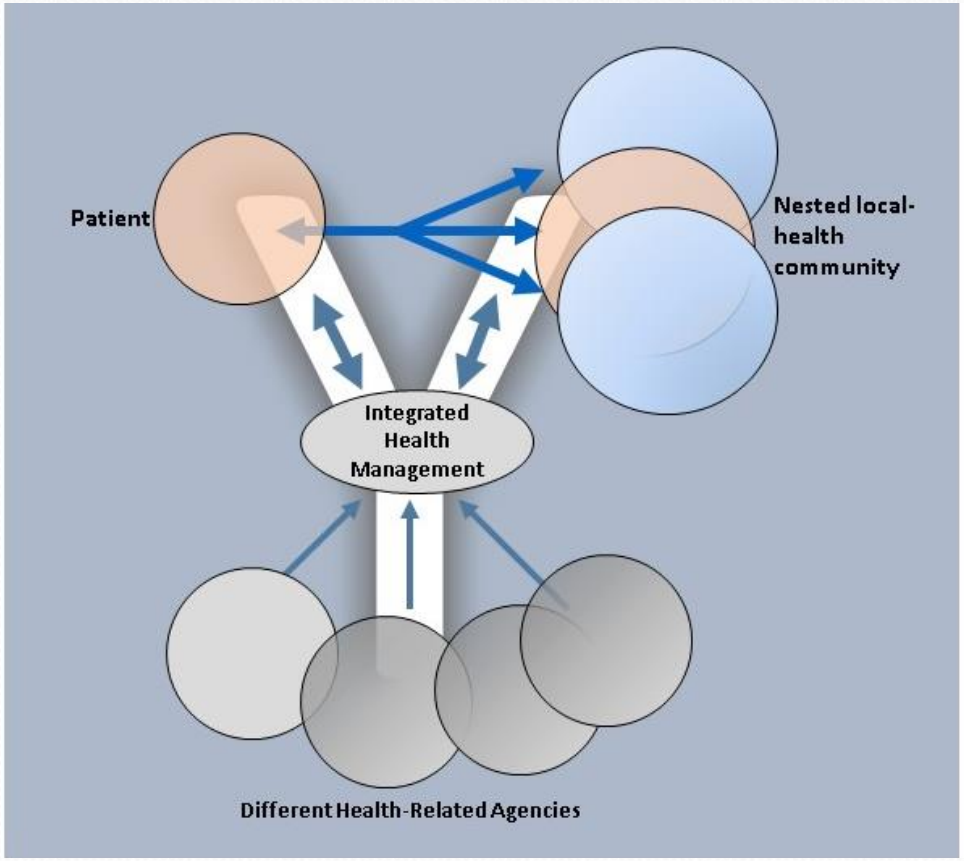
2. A home-based, community-centre e-governance healthcare

Combination of social and health services in an integrated relational management to the patients in their natural context. The patient is in the centre of the formal resources and informal health and local communities.



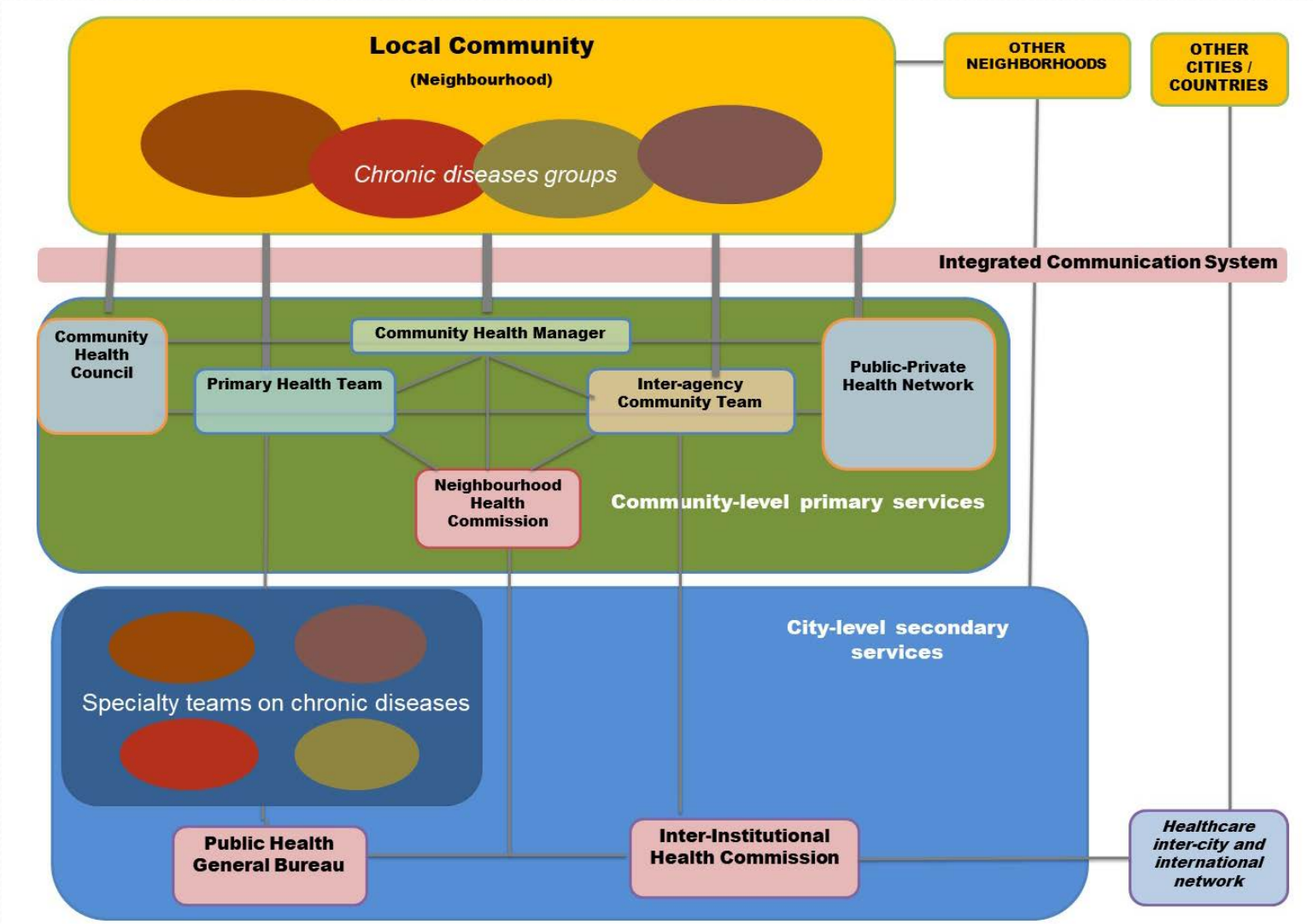
Healthcare e-governance management.

A *Y-relational* health information management promotes the relationship between the health and social agencies and resources to enhance the support and empowerment of the local and health communities with the patient. Healt community managers will facilitate the integration of resources in the direct relationship with the patient.



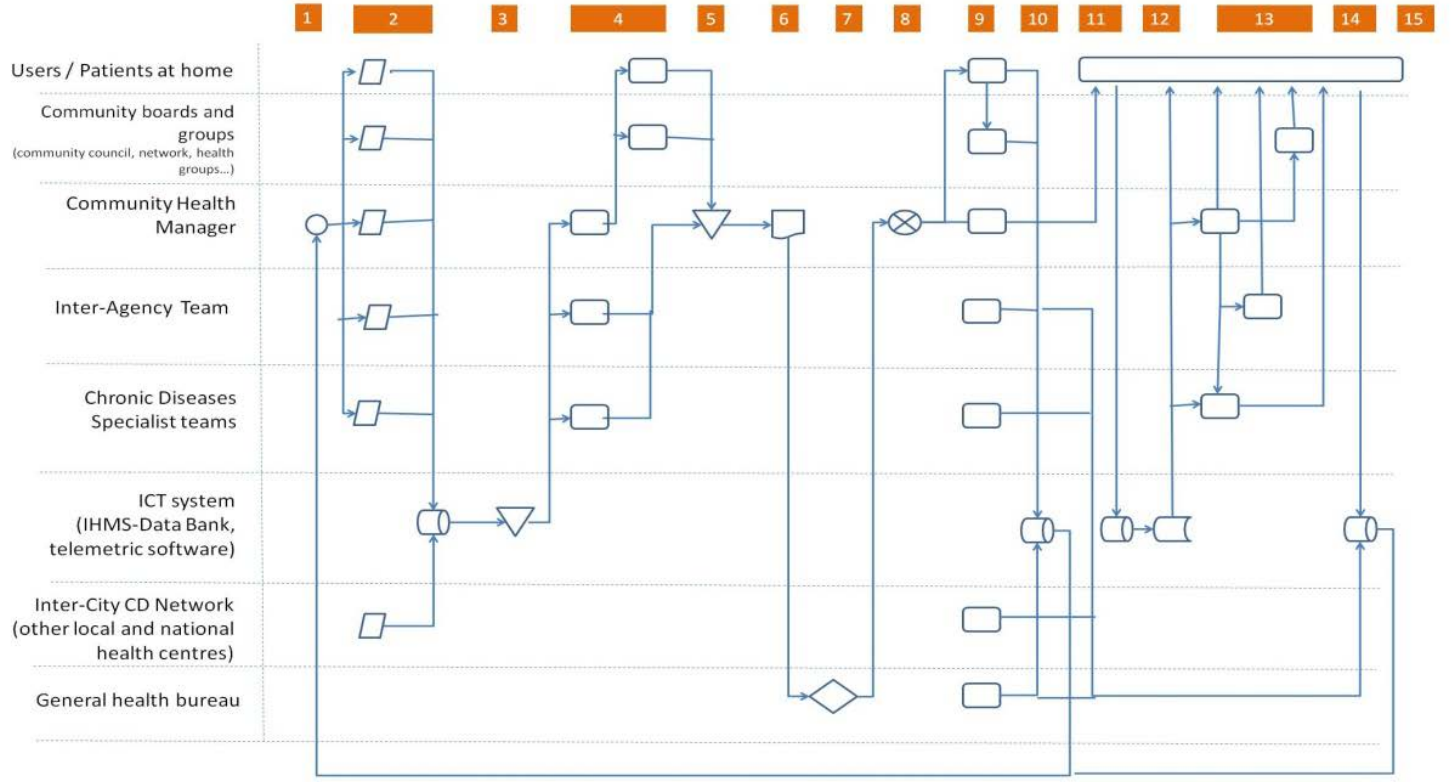
Healthcare e-Governance community structure of services

- A local community health manager facilitates the integration of services and resources.
- Community participation and support is promoted through a *Community Health Council.*
- The collaboration between private and public institutions is promoted through a *Public-Private Health Network* in the neighbourhood.



System process

Clear and well-defined pathways of prevention and health promotion for persons and families within the family environment , community, and city.



1. Start of the process
2. Citizens´ information entered in Data Bank (through online questionnaires)
3. Data integration and classification in health profiles
4. Analysis of the information and deliberations for community health planning
5. Integration of analyses, definition of plan, programmes, and projects
6. Release of Community Health Plan, with Programmes for chronic disease groups
7. Authorization of Community Health Plan and Programmes
8. Organization and implementation of programmes
9. Preventive Programme for healthy groups. Involvement in community groups
10. Information recording on healthy groups and Programme evaluation
11. Tele-monitoring system applied to selected chronic patient groups and data recording
12. Data analysis, released of predictive and monitoring information to stakeholders
13. Healthcare and preventive intervention in selected chronic patients
14. Information recording on chronic patients and Programme evaluation
15. Evaluation of Plan and back to sys start

Conclusion

This healthcare system implies a 180º turn in the traditional health management and delivery approach, aimed at bringing more effective, cost-efficient, and preventive care while improving the patients´ and carers´ quality of life in their ecosystem.

A reduction of financial resources may contribute to the economical sustainability at the long run, while reaching all those citizens most needed of services. This may brings an advance in the inclusion of those most vulnerable groups, improving the democratic values in our societies.

¡THANK YOU!