

## EU-US e-Health Policy Workshop

### SESSION 2B: Improving the Quality and Continuity of Healthcare

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## Summary

### • **Fact and figures about lifestyle-related disease and in Europe**

- The relationship between **diet, physical activity and health**: determinant of chronic non-communicable diseases and conditions such as obesity, heart disease, type 2 diabetes, hypertension, cancer and osteoporosis.
- Unhealthy diets, lack of physical activity leading causes of avoidable illness/premature death in EU.
- Cardiovascular disease and cancer principal causes of mortality in Europe; obesity, overweight and type 2 diabetes is rapidly increasing in all regions of Europe.
- Obesity levels in the EU have risen by between 10-40% over the past decade, current data suggest range of obesity prevalence in EU countries is from 10% to 27% in men and up to 38% in women.
- In some EU countries more than half the adult population is overweight (BMI >25), and in parts of Europe (Finland, Germany, Greece, Cyprus, the Czech Republic, Slovakia and Malta) the combination of reported overweight and obesity in men exceeds the 67% prevalence found in the USA's most recent survey
- In EU, 14 million **children** are estimated to be overweight, and a further 3 million classed as obese. Moreover, the number of overweight children is increasing rapidly, currently rising by 400,000/year.

### **Self-care management: the case of poor adherence to pharmaceutical therapy regimens and emerging ICT solutions**

- In the US, 33 to 69 percent of all medication-related hospital admission, are due to poor medication adherence, with resulting cost of approximately \$ 100 billion a year.
- In clinical trials, reported average adherence rates of only 43 to 78 percent among patients receiving treatment for chronic conditions.
- World Health Organization has published a report, in 2003: Adherence to long-term therapies: evidence for action.
- **Emerging systems for assisted pharmaceutical therapy regimens**: Combination of terminals (smart phones), automatic identification system (e.g., barcode, tag RFID), devices (e.g., smart cabinet, active smart package) performs automatic reminder, warnings, to patient, relatives, nurses, doctors and provide logs.

### **Call for action to support inter-discipline and inter-market approaches to promote effective ICT-based system design and business models**

The case of poor adherence to physiological parameters monitoring, the need to integrate monitoring of physical activity parameters and nutritional parameters call for ICT-integrated and reliable solution crossing different markets and value chains products: **pharma and diagnostic devices, consumer electronics, food and beverage (from industry to supermarkets), fitness, edutainment.**

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## **Continuity of care, health promotion and lifestyle management: context and trends**

### ***Medical Scientific Community totally committed to supporting disease Prevention through Continuity of Care***

The Scientific community has for a long time recognized Continuity of Care as a powerful means to support disease prevention (Primary - to diminish the risk of a disease occurrence, Secondary – to diminish the risk of chronic disease development to critical stages, that require hospitalization and in consequence higher Individual and societal costs).

### ***Mass Media emphasizing prevention and healthier lifestyle messages***

Mass media has widely informed Citizens on how individual daily choices and behaviours can impact on their health and on how technology can support health life style decision making. As a result of mass media communication and marketing communication strategies, the potential market demand of self-care tools and services for the promotion of healthier lifestyles at each stage of life is constantly increasing.

### ***Independent market value chains indicate trends of business convergence, as a result of targeting prevention and wellbeing***

Healthcare market actors (public and private insurances and healthcare providers), health products and technology manufacturers (e.g., pharma, self-care monitoring devices) and health-related consumer markets actors (e.g., fitness, food & beverage, consumer electronic value chains) are increasingly targeting health, wellbeing and prevention for marketing their products and services, as part of their product and service innovation patterns.

### ***Independent market value chains indicate trends of technological convergence, as a result of grounding product and service innovation on ICT paradigms***

R&D collaborative or proprietary initiatives in different market domains are sharing ICT tools and paradigms (e.g., seamless connectivity, devices digitalization, miniaturization and integration, event-driven workflow engines, web service-oriented architectures) that favours in-market and cross-market system and service integration and business synergies among heterogeneous market players.

### ***The informed Citizen engagement in the process of self-care***

Macro-trends indicate a fragmented but coherent evolving scenarios driven by key values of *Continuity* and *Quality*, i.e. the ability of the Citizen to receive timely and appropriate medical advice and take autonomous and informed decision on health-related behaviours, e.g.; monitoring diagnostic parameters, adherence to drug therapies, nutritional and physical activity guidelines and prescriptions.

## **ICT as enabler of Citizen engagement and empowerment**

### ***Limits of unassisted self-care regimen***

Engaging the Citizen in the process of his/her own care is a critical factor both to achieve changes in his/her behaviour and to sustain the exponential growth of health demand with the scarcely available existing healthcare resources (doctors, nurses, pharmacists, health technologies and products, hospitals, ambulatories, etc.). Present self-care strategies are mainly relying on the assumption that, given specific tasks and assignments to the Citizen he/she will be able to unequivocally understand conditions under which tasks should be performed and act accordingly, i.e. as prescribed by his/her doctor. Unfortunately, such a

reliance on Citizen autonomy has already proven to have a significant ratio of failure, thus demanding for innovative solutions and approaches to be developed.

### ***An example: poor adherence in unassisted self-care in pharmaceutical therapy management***

As good example of the need for improving efficiency and effectiveness of self-care regimen with innovative systems, we can analyse a very simple self-care process: **adherence** (or compliance) to a medication regimen, i.e. the extent to which patient takes medication as prescribed by their healthcare provider, and **persistence**, i.e. the extent to which patients maintain adherence in the long term.

Poor adherence to medication regimens accounts for substantial worsening of disease, death, and increased healthcare costs. In the US it has been found that: of all medication-related hospital admissions 33 to 69 percent are due to poor medication adherence, with a resulting cost of approximately \$ 100 billion a year. The average rates of adherence in clinical trials can be remarkably high, owing to the attention study patients receive and to the selection of patients, yet even clinical trials report average adherence rates of only 43 to 78 percent among patients receiving treatment for chronic conditions<sup>1</sup>.

Given the impact of poor adherence to long term therapies, the World Health Organization has published a report, in 2003, calling for action to tackle this important issue.<sup>2</sup> Barriers to medication adherence are numerous, but include the prescription of complex medication regimen, the treatments of asymptomatic conditions, the perception of risk, etc.

### ***ICT-assisted self-care in pharmaceutical therapy management***

The need for improving efficiency and effectiveness of self-care pharmaceutical therapy management has led to the deployment of ICT systems that are basically designed to implement fool-proof control strategies, i.e.: a scheduler acts as a reminder for the patient, a reminder is sent to the attention of the patient on a personal terminal (e.g., smart phone), an automatic identification system (e.g., barcode, tag RFID) is embedded into the personal terminal or into a different device (e.g., smart cabinet, active smart package) to provide real time feedback to the system. The system reacts according to a pre-determined set of condition sending reminders or warnings to the patient, a relative, the doctor and logs all related data in a personal patient record. A variety of auxiliary services (e.g., educational, informative, commercial) are offered in combination. In different parts of the pharma value chain, tag RFID enables track and trace functionalities, aiming at the supply chain optimization and anti-counterfeit purposes (e.g.: Electronic Product Code – ePC – initiatives, that may provide significant synergies.

### ***Extending ICT-assisted self-care to other Individual's health tasks***

Medication adherence and persistence as been taken as an example, but tasks for the Citizen at risk of worsening his/her health state include the need of self-monitoring or remote-monitoring, for example:

- physiological or biochemical parameters (e.g., hart rate, blood pressure, weigh, body impedance; glucose, triglycerides, cholesterol blood level);
- fitness and physical activity parameters (e.g., daily energy burnout in term of calories, Body/Mass Index-BMI);
- nutrition parameters (e.g., nutrients and calories intake, adherence to Recommended Daily Doses-RDAs, sodium intakes, fat/saturated fatty acids in-take);
- mood and stress parameters (e.g., reactiveness to environmental stimuli);
- sleep parameters (e.g., duration, quality).

### ***Self-care management for prevention and healthier the lifestyle***

From a Citizen perspective, the self-management process of primary and secondary prevention requires performing multiple tasks in daily life, as a result of a dynamic combination extracted from the above (not exhaustive) list of parameters and being seamlessly assisted in taking informed decisions, and acting accordingly, to achieve and maintain healthier behaviours, that in turn must be monitored and re-addressed. Particular attention should be dedicated to children's lifestyle-related issues and the peculiarity of addressing primary and secondary prevention to such a sensible and "digitally native" population target.

### ***Fact and figures about lifestyle-related diseases and prevalence in Europe***

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<sup>1</sup> L. Osterberg, T. Blaschke, Adherence to medication, Newengland journal of medicine, aug. 4, 2005

<sup>2</sup> E. Sabate, Adherence to long-term therapies: evidence for action. Geneva, World Heath Organization, 2003

- The relationship between diet, physical activity and health has been scientifically established, in particular regarding the role of lifestyles as determinants of chronic non-communicable diseases and conditions such as obesity, heart disease, type 2 diabetes, hypertension, cancer and osteoporosis<sup>3</sup>.
- Unhealthy diets and lack of physical activity are therefore the leading causes of avoidable illness and premature death in Europe<sup>4</sup>.
- Although cardiovascular disease and cancer still constitute the principal causes of mortality in Europe, the prevalence of obesity, overweight and type 2 diabetes is increasing in all regions of Europe at unsettling rates.
- The rising rates of obesity across Europe, especially among young people, have alarmed health experts, the media and the population at large, and is a major public health concern. Evidence from population surveys suggests that obesity levels in the EU have risen by between 10-40% over the past decade, and current data suggest that the range of obesity prevalence in EU countries is from 10% to 27% in men and up to 38% in women<sup>5</sup>.
- In some EU countries more than half the adult population is overweight <sup>6</sup> (BMI >25), and in parts of Europe (Finland, Germany, Greece, Cyprus, the Czech Republic, Slovakia and Malta) the combination of reported overweight and obesity in men exceeds the 67% prevalence found in the USA's most recent survey<sup>7</sup>

### ***Fact and figures about Children's lifestyle-related diseases in Europe***

- Excess body weight in children is of particular concern as across the EU, 14 million children are estimated to be overweight and a further three million classed as obese. Moreover, the number of overweight children is increasing rapidly, currently rising by 400,000 a year.<sup>8</sup> Overweight is associated with a number of comorbidities in children. Although the amount of information available about youth is less than that about adults, it is clear that children experience many detrimental effects of overweight similar to adults.

### ***Challenges and need of cooperation***

The development of a coherent system of federated health-related services delivering timely information, education and self-care support to the Individual, across different market value chains (healthcare insurance and delivery, fitness, consumer electronics, edutainment, food and beverage – from manufacturers to retailers) is for the time being clearly an unrealistic vision in a market perspective, although trends clearly give evidence of a “spontaneous” partial aggregation of multiple actors.

**EU-US cooperation in such a complex, dynamic and interdisciplinary super-domain should aim at facilitating and speeding up the ongoing “spontaneous” evolution trend of health-driven convergence that is blurring the traditional concepts of Patient and Consumer, by:**

- **promoting the aggregation of experts - i.e. developing a critical mass of interdisciplinary expert through cross-fertilization across the multiplicity of disciplines and market domains relevant to continuity of care and health promotion,**
- **collecting, analysing and sharing best practices, achievements, synergies of collaboration among actors of different market niches within the same scientific disciplines and market domain (e.g., diagnostic devices and pharma), as well as actors of different market domains (e.g., food and beverage manufacturers and retailer, fitness and edutainment with e-health services),**
- **Establishing a dedicated discussion forum on health-related business and technology convergence.**
- **developing and deploying a distributed test-bed, to favour pragmatic aggregation and visibility of achievements and to stimulate third parties participation,**
- **favouring interoperability, connectivity and open/non proprietary approaches among lifestyle-related products, technologies, services and information flows, stimulating R&D fast prototyping approaches, within the test-bed framework.**

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<sup>3</sup> Diet, Nutrition and the Prevention of Chronic Diseases, Report of a Joint WHO/FAO Expert Consultation, 2003 ([www.who.int/dietphysicalactivity/publications/trs916/download/en/index.html](http://www.who.int/dietphysicalactivity/publications/trs916/download/en/index.html))

<sup>4</sup> World Health Organization. The World Health Report: 2002: Reducing risks, promoting healthy life, Geneva: World Health Organisation, 2002

<sup>5</sup> International Obesity Task Force EU Platform Briefing Paper, March 2005

<sup>6</sup> The European Health Report, World Health Organisation, 2002

<sup>7</sup> International Obesity Task Force EU Platform Briefing Paper, March 2005

<sup>8</sup> EU Green paper, Rles report in press