

## Supplementary Material

**Appendix 1.** Ad-hoc questionnaire to assess the Smart e-Skin Cancer Care in Europe during and after the COVID-19 pandemic.

This questionnaire was divided in: “weaknesses” (17 items), “strengths” (12 items), “opportunities” (12 items) and “proposal of changes” (11 items).

The score of each item ranges from 0 to 3 (no relevant to high relevance)

### Weaknesses

1. The constant increase in number of cases of skin cancer in the next years with limited health budget
2. Limited access to skin cancer clinics
3. Primary prevention: no sufficient change in attitudes of sun protection of general population
4. Limited capability by population of self-recognition of skin cancer
5. No significant reduction of fatal melanoma incidence
6. Staging of skin cancer (TNM) in skin cancer in general (melanoma, Merkel cell carcinoma, epithelial cancers) is not accurate to guide treatment and follow-up after the diagnosis.
7. Medical treatments (specially systemic treatments) are expensive and patients have limited access to them (inequity)
8. Indication of treatment (surgery, adjuvant, neoadjuvant, metastatic) is not guided with good biomarkers
9. Limited access to surgery with 3-D margin assessment in high risk epithelial tumors in many countries in Europe
10. Limited access to innovative systemic treatments in many countries in Europe
11. Restricted access of patients to clinical trials in some referral centers
12. Disparities in the follow-up of patients with melanoma
13. Limited use of solutions of e-Health
14. Lack of communication among professionals, patients and caregivers
15. Limited psychological support to patients and family caregivers
16. Other relevant weaknesses

### Strengths of the traditional strategies (What is worth to keep)

1. Education of population: campaigns, education at school, family caregivers, etc.
2. Development of modern sunscreens
3. Identification of high-risk population
4. Follow-up by dermatologists of high-risk patients
5. Use of dermatological diagnostic technology: dermoscopy, digital follow-up, RCM, OCT, others
6. Use of better radiology capabilities
7. Use of e-Health: Tele dermatology, Skin cancer apps
8. Treatment of precursors, field cancerization, actinic keratosis

9. Education of health care non-dermatologists: GPs, nurses, other health care professionals
10. Multidisciplinary management of skin cancer
11. Investment in research
12. Investment in development of systemic treatment

### **Opportunities**

1. Need of re-thinking health (brought by the COVID)
2. The 4th industrial revolution: robotics, AI, IoT, Biotech, Big Data, 3D printing
3. Easier implementation of changes due to the crisis of the pandemic (health organization, work-flow of patients, organization of working time, teledermatology, prioritisation of resources, etc.).
4. Easy-to-do education with digital media
5. Faster implementation of e-Health brought by COVID
6. Better knowledge of the disease (research)
7. Genetic risk assessments for melanoma (genetic risk score)
8. Better knowledge and technology for fast phenotyping of the population and detection of risk groups to follow (detection of sun damage, pigmentation traits, subtypes and number of nevi, etc.)
9. Better technology for skin diagnostics and follow-up
10. Better biotechnology
11. Faster development of new drugs (discovery, clinical trials, approval, ...)
12. Expansion of the patient's capabilities (patient's empowerment)

### **Proposal of changes**

1. Better education for all the players (patients, general population, education professionals, psychologists, communicators, Health-professionals) using social media and digital capabilities.
2. Apps for education in skin cancer
3. Apps for self-detection of skin cancer
4. Increase of the number of skin cancer specialists
5. Identification of the true risk population: use of genetics, deep phenotyping
6. Staging of skin cancer using biotech, artificial intelligence, Big Data.
7. Collaboration among Pharma companies for new discoveries
8. New models for faster (cheaper) clinical trials and regulatory issues of new drugs
9. Facilitate stronger patients' associations
10. Improve patient's empowerment
11. Other proposals