Good Practice template

* All Good Practices identified by an Interreg Europe project and reported in the progress reports have to be submitted to the Programme.
* In order to submit a practice, you will have to register in the Interreg Europe website. Online submission will be available the first semester of 2017.
* NB: in orange: 2 optional fields. All other fields are compulsory.

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| 1. **General information**
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| **Title of the practice** | *SCN4ALL* |
| **Does this practice come from an Interreg Europe Project** | *Yes or no**[Technical: Good Practices outside the IR-E projects relevant to the topics and validated by the Policy Learning Platforms experts will also be included in the database]* |

In case ‘yes’ is selected, the following sections appear:

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| ***Please select the project acronym*** | *HoCare* |

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| **Specific objective** | *Drop-down list of the 6 specific objectives* *[Technical:* *In case a project is selected, the specific objective is automatically completed]* |
| **Main institution involved** | *[Technical: The name of the institution and location of the practice are per default those of the practice author. They remain editable.]* |
| **Location of the practice** | Country | *Hungary* |
| NUTS 1 | *CENTRAL HUNGARY* |
| NUTS 2 | *Central Hungary* |
| NUTS 3 | *Drop-down list* |

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| 1. **Detailed description**
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| **Detailed information on the practice** | *PLEASE NOTE THAT THE GP BELOW IS SUBJECT TO COPYRIGHT. SOME INFORMATION ARE CONFIDENTIAL DUE TO THEIR NATURE OF BEING BUSINESS SECRETS OR SENSITIVE DATA PROTECTED BY LAW, THEREFORE, UNDISCLOSED BY THE COPYRIGHT PROPRIETOR (GP OWNER).**The solution offered by SCN4ALL is based on an evaluation algorithm that analyses the physiological functions of the cardiovascular and autonomic nervous systems, and has a wide range of applications in medicine: monitoring the condition of patients with hypertension, heart failure or arrhytmias, diabetes or lung disease, or monitoring the effectiveness of therapies.* *The company, E-Med4All Europe Ltd., has developed a pulse oximeter-based heart rate variability and pulse wave analysis telemedicine system that can monitor more than 30 physiological parameters to track the health of asymptomatic people, monitor those in quarantine and analyse the data for early detection of possible disease onset. Potential patients can be monitored using a simple and easily disinfectable device, a smart pulse oximeter, and the measured data is sent to a processing unit in the cloud via smartphone or tablet by a dedicated app.* *Each measurement takes 2 minutes and can be performed by the user independently several times a day, without the need to burden healthcare staff. The measurement data can be monitored remotely, even via the internet, by the professional in charge of the elderly person's medical supervision.**Although most of the cardiovascular monitoring parameters offered by the SCN4ALL system were already known to science, their practical application, especially for the general population, was not yet solved. The innovative nature of their ICT solution stems both from the research and development work needed to put the parameters into practice and from the development of a solution to make the service available to the general public. All that is needed to access the service is an easily obtainable special pulse oximeter, a mobile device to run the application and an internet connection. A further innovative feature of the product is that it can allow the early prediction of the onset of certain diseases, in many cases anticipating the possibilities offered by traditional diagnostic methods. (Research is ongoing to prove further clinical utilities of SCN4ALL.)* |
| **Resources needed** | *ca. 1.300.000 (1,3M) EUR* |
| **Timescale (start/end date)** | *2017-2020**Preliminary development and prototyping started in 2017. The MVP was released in 2018 and the product version used in the project in 2020.* |
| **Evidence of success (results achieved)** | 1. *Currently, the GP owner’s pulsewave database contains ~100.000 pulsewave registrations of ca.5.000 patients (N:B.: not all users registered).*
2. *During the pandemic, the COVID-19 National Task Froce approved a pilot project, in which 200 SCN4ALL smart pulse oximeters were distributed amongst 40 general practitioners to remotely monitor high risk COVID-19 patients (a success to save a great many lives according to the participating doctors). (*[*http://medicalonline.hu/gyogyitas/cikk/covid\_19\_beteg\_arterias\_funkcioinak\_valtozasai\_fotopletizmografia\_alapu\_pulzushullam\_analizis\_alapjan*](http://medicalonline.hu/gyogyitas/cikk/covid_19_beteg_arterias_funkcioinak_valtozasai_fotopletizmografia_alapu_pulzushullam_analizis_alapjan)*,* [*https://24.hu/belfold/2020/12/14/pulzoximeter-haziorvos-megfigyeles-karanten/*](https://24.hu/belfold/2020/12/14/pulzoximeter-haziorvos-megfigyeles-karanten/) *)*
3. *Consecutive projects with Hungarian primary care nurses (primary pregnancy and perinatal care) since 2019, whereby more than 50 nurses used already the system, recorded around 10.000 measurements. Results were demonstrated at the Conference on the Future of Europe series (*[*https://futureu.europa.eu/processes/Health/f/4/meetings/128273?locale=en*](https://futureu.europa.eu/processes/Health/f/4/meetings/128273?locale=en)*)*
4. *First peer-reviewed article: Kulin, D.; Antali, F.; Kulin, S.; Wafa, D.; Lucz, K.I.; Veres, D.S.; Miklós, Z. Preclinical, Multi-Aspect Assessment of the Reliability of a Photoplethysmography-Based Telemonitoring System to Track Cardiovascular Status. Appl. Sci. 2020, 10, 7977.* [*https://doi.org/10.3390/app10227977*](https://doi.org/10.3390/app10227977)
5. *Multimodal Assessment of the Pulse Rate Variability Analysis Module of a Photoplethysmography-Based Telemedicine System. Antali, F.; Kulin, D.; Lucz, K.I.; Szabó, B.; Szűcs, L.; Kulin, S.; Miklós, Z. Appl. Sci. Sensors 2021, 21, 5544.* [*https://doi.org/10.3390/s21165544*](https://doi.org/10.3390/s21165544)
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| **Difficulties encountered/ lessons learned** | *GP owner did not reveal this information. Mainly for the reason that disclosure would involve medical, technological and medical engineering data.*  |
| **Potential for learning or transfer** | *In its current state, the system can measure conventional parameters such as:**• Heart rate: this is the average of the heart rate recorded during the measurement;* *• SpO2 = arterial blood oxygen saturation.**In addition,* ***it is also capable of measuring so-called pulse wave parameters****, which is a* ***technological upgrade******compared to the conventional pulse oximeter:****• Stiffness index = stiffness index of large vessels: the larger our aorta and the wall tension of our large vessels, the higher stiffness index values we can obtain;**• Small vessel tone: the ratio of the systolic (during heart contraction) to the diastolic (during aortic pulsation) peaks of the pulse wave.**• Cardiac ejection time related parameters**• Arterial ageing related parameters**• Left ventricular ejection dynamics related parameters**• Aortic distensibility related parameters**• Heart rate variability parameters* *• Arrhythmic pulse related parameters**Further to the non-conventional parameters that the device can measure, it:* *• is easy to use;* *• does not cause pain;* *• operates with the shortest possible measurement time;* *• has increased functionality and information from one measurement;* *• provides continuous monitoring;**•* ***tracks trends of change in the body;****• has the potential to* ***help to prevent serious cases\* (e.g. heart attack, stroke and other major CVDs) by being suitable for functioning as an early warning mechanism – \*under validation****• CAN BE FURTHER DEVELOPED, adding more measurement parameters.* |
| **Further information** | [*https://hello.emed4all.com/en/scn4all/*](https://hello.emed4all.com/en/scn4all/) |
| **Contact details** *[Technical: the contact details will be visible only to “Policy Learning Platforms registered members”* |
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| **Expert opinion**  | *[500 characters] [****Technical: to be filled in by the Policy Learning Platforms experts****]* |