New technologies for public service: Would their use help engage people in radiation protection and preventive health behaviour?

(SHAMISEN SINGS project)

Lidmila Liutsko; Adeliada Sarukhan, & Elisabeth Cardis; SHAMISEN SINGS Consortium

ISGlobal Barcelona Institute for Global Health

A partnership of: "la Caixa" Foundation

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SHAMISEN SINGS PROJECT

SHAMISEN SINGS project (PI: Elisabeth Cardis)
SHAMISEN (**N**uclear **E**mergency **S**ituations - **I**mprovement of dosimetric, **M**edical **A**nd **H**ealth **S**urveillance) - **S**takeholder **IN**volvement in **G**enerating **S**cience (SINGS)

Web: http://radiation.isglobal.org/index.php/en/shamisen-sings-home

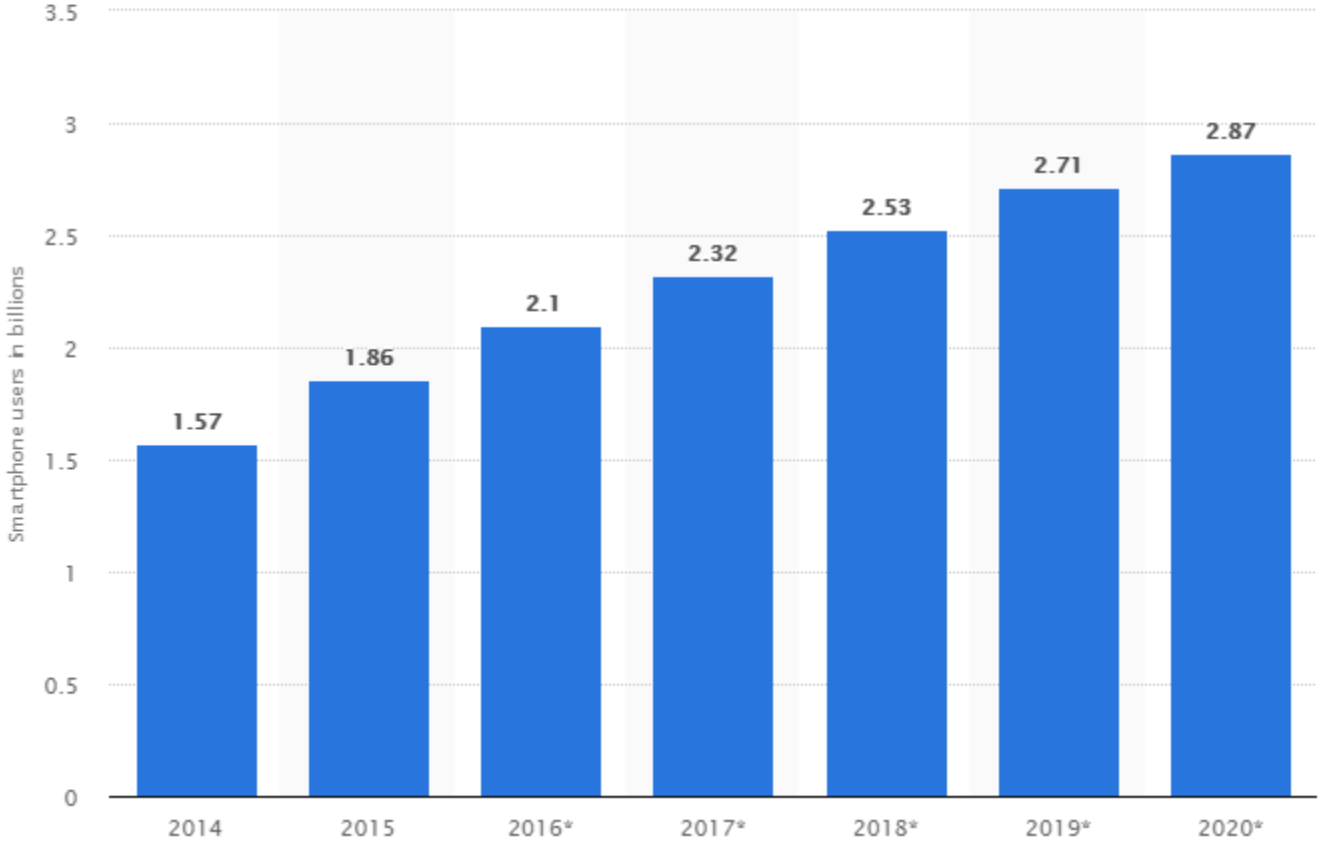
SHAMISEN SINGS
Stakeholder Involvement in Generating Science After Nuclear Emergencies

EUROPEAN JOINT PROGRAMME FOR THE INTEGRATION OF RADIATION PROTECTION RESEARCH
CONCERT

ISGlobal
Barcelona Institute for Global Health

PARTNERS and EXPERTS of the project SHAMISEN SINGS

Number of smartphone users worldwide from 2014 to 2020 (in billions)

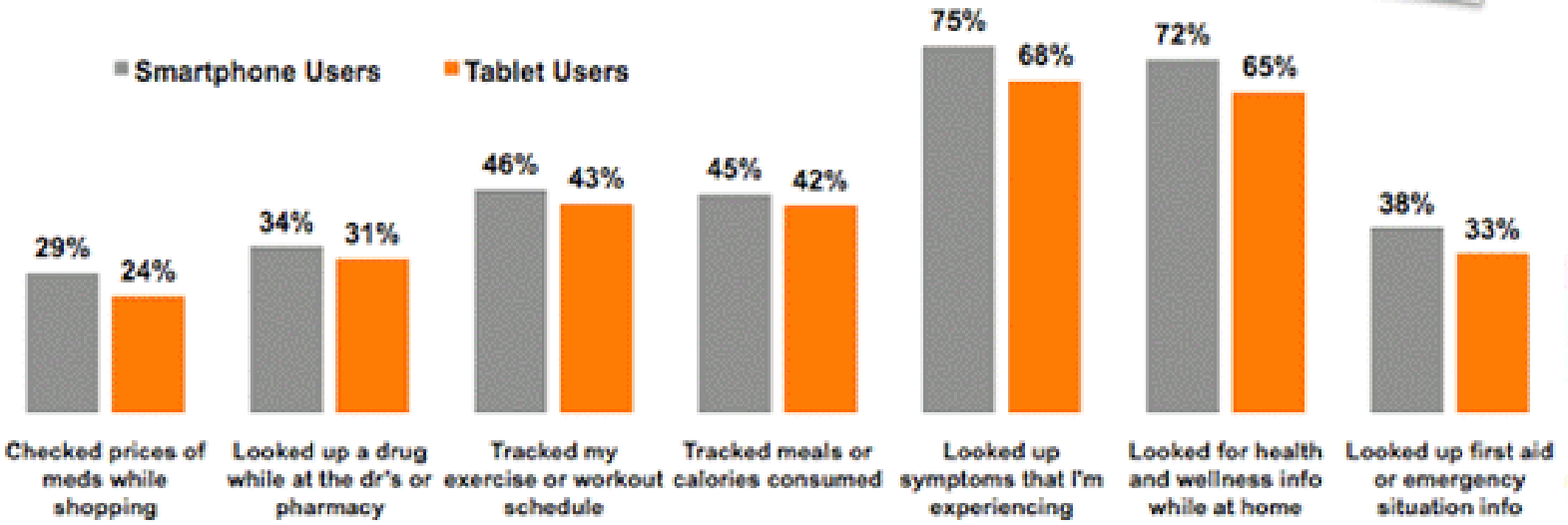


Source: statista (2018)

Mobile Device Usage For Health & Wellness

Using your Smartphone & Tablet for health related information

- Half of all Smartphone owners (45.7 million) said they use their phone to look for health & wellness information in the last 30 days
- Nearly 3 out of 5 (19 million) said they use their Tablet



Source: 2012 MRS Online Behavior Study

GOALS

The general goal of SHAMISEN SINGS is **enhancing Citizen Participation in the aftermath of a radiation accident**
through the collection of data on ***dose measurements*** and on ***health and well-being*** indicators.

Specific objectives:

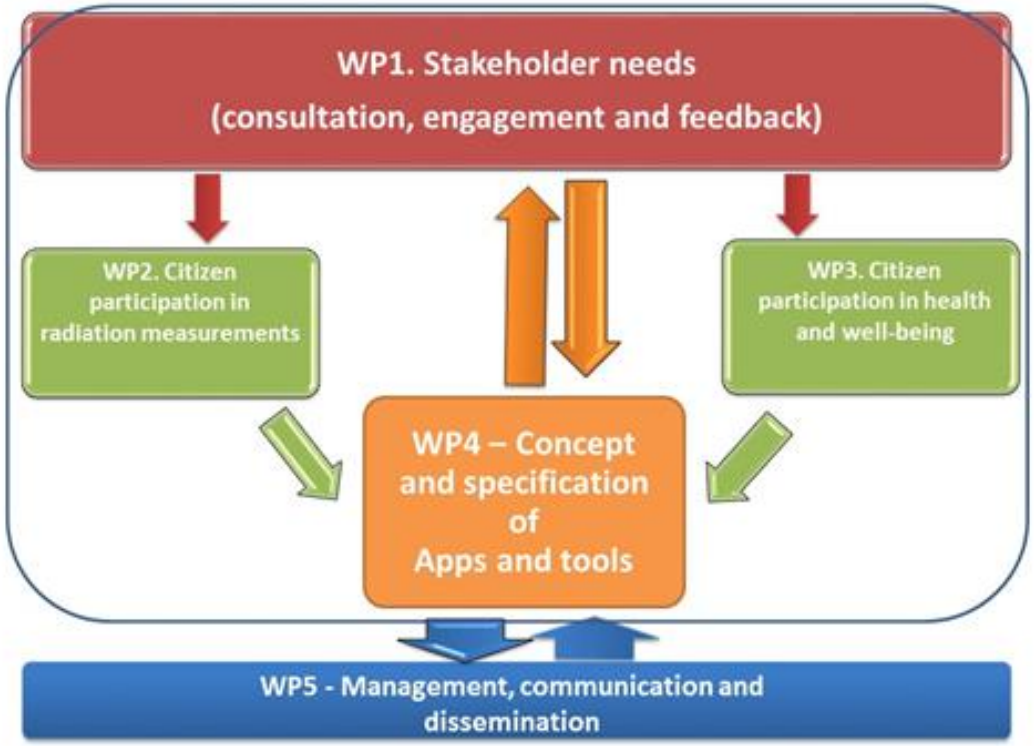
-**Interact with stakeholders** (including citizens and experts) to assess their needs and interest in contributing to global dosimetry and health measurements.

-**Review existing APPs** related to citizen-based approach in : 1) dose measurements & 2) for health monitoring (including social and psychological issues of a radiation accident).

-**Assess ethical challenges** and implications of both the APPs and citizen science activities by co-reflection between natural and social scientists, public, authorities and other stakeholders.

GENERAL STRUCTURE

The project's structure:



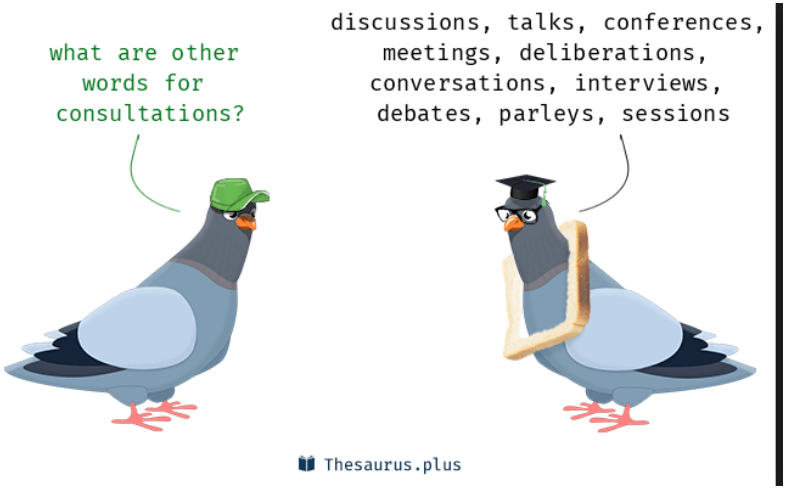
WP1 objectives & tasks

WP1. Stakeholder needs (consultation, engagement and feedback on proposals)
Lead: ISGlobal, Partners: WIV-ISP, NMBU, CEPN, ISS, IRSN, Experts: V. Chumak (Ukraine), Ph. Pirard (France), N. Novikava (Belarus)

Objective:

-to engage stakeholders (representatives of local populations, teachers, medical personnel, authorities) to identify their needs (immediate and long-term phases of an accident), and

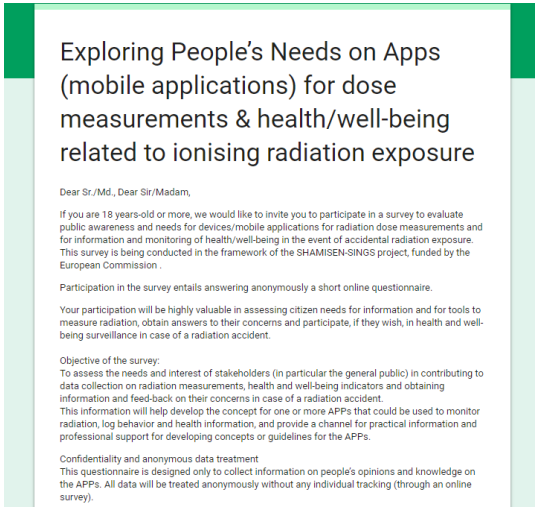
- propose a tool (or framework for a tool) using new information technologies.



WP1 objectives & tasks

WP1. Stakeholder needs (consultation, engagement and feedback on proposals)

Task 1.1. Stakeholder meeting and consultation to identify unmet needs
(reunions + on-line)



Exploring People's Needs on Apps (mobile applications) for dose measurements & health/well-being related to ionising radiation exposure

Dear Sr./Md., Dear Sir/Madam,

If you are 18 years-old or more, we would like to invite you to participate in a survey to evaluate public awareness and needs for devices/mobile applications for radiation dose measurements and for information and monitoring of health/well-being in the event of accidental radiation exposure. This survey is being conducted in the framework of the SHAMISEN-SINGS project, funded by the European Commission .

Participation in the survey entails answering anonymously a short online questionnaire.

Your participation will be highly valuable in assessing citizen needs for information and for tools to measure radiation, obtain answers to their concerns and participate, if they wish, in health and well-being surveillance in case of a radiation accident.

Objective of the survey:
To assess the needs and interest of stakeholders (in particular the general public) in contributing to data collection on radiation measurements, health and well-being indicators and obtaining information and feed-back on their concerns in case of a radiation accident.
This information will help develop the concept for one or more APPs that could be used to monitor radiation, log behavior and health information, and provide a channel for practical information and professional support for developing concepts or guidelines for the APPs.

Confidentiality and anonymous data treatment
This questionnaire is designed only to collect information on people's opinions and knowledge on the APPs. All data will be treated anonymously without any individual tracking (through an online survey).

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FILTROS

Your Voice is Important! Developing an App to Engage Citizen Participation in Case of a Radiation Accident

1 June 2018

Adelaida Sarukhan
Scientific writter

[This article has been written by the ISGlobal members: Adelaida Sarukhan, scientific writer, Liudmila Liutsko, postdoctoral fellow, and Elisabeth Cardis, Head of the Radiation Programme]

"Would you be interested in using a mobile app that allows you to measure radiation?"

Task 1.2. Focus group assessment of proposals *(from WP2, WP3 and WP4)* ***by stakeholders***

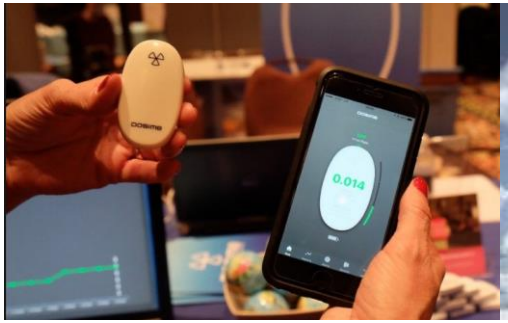
Task 1.3 SHAMISEN-SINGS Consensus Workshop *(Lead NMBU)* (to address the **societal, ethical** and **technical challenges** with APP development and use, as well as its contribution to Citizen Science)

WP2 objectives & tasks

WP 2 – Citizen participation in radiation measurements
Lead: ISS; Partners FMU, IRSN, UAB, ISGlobal; Expert: V. Chumak (Ukraine)

Objectives:
-to improve the usage of devices and apps able to turn smartphones (other tools) in radiation detectors for self-measurements by different categories of population, and

-to provide the collection and feed of data, essential for dose reconstruction.



WP2 objectives & tasks

WP 2 – Citizen participation in radiation measurements

Task 2.1 Critical review of existing plug-in's and apps to turn smart devices in radiation detectors

Task 2.2 Improvement of the appropriateness of self-measurements (accuracy, robustness and user friendliness). Integration *of citizen measurements* ***into existing monitoring networks*** *at the national and European level*

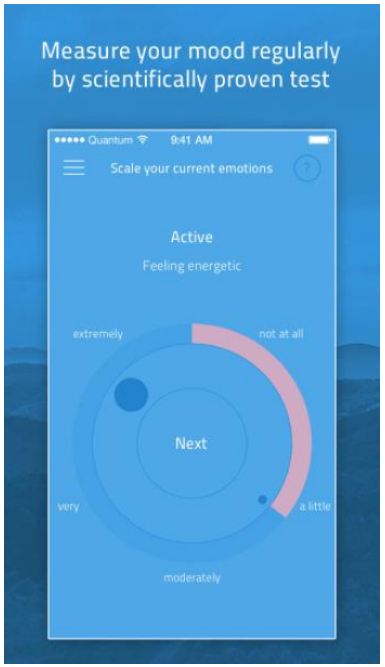
Task 2.3 Improve or develop interactive platforms *or tools* ***for communication and dialogue*** *on radiation measurements and results (based on needs learnt from WP1 stakeholder consultation)*

Task 2.4 Optimization of proposals *based on WP1 feedback*

WP3 objectives & tasks

WP 3 – Citizen Participation in health and well-being monitoring

Lead FMU. Partners: ISGlobal, IRSN, WIV-ISP, NMBU, CEPN, Ph Pirard (expert)



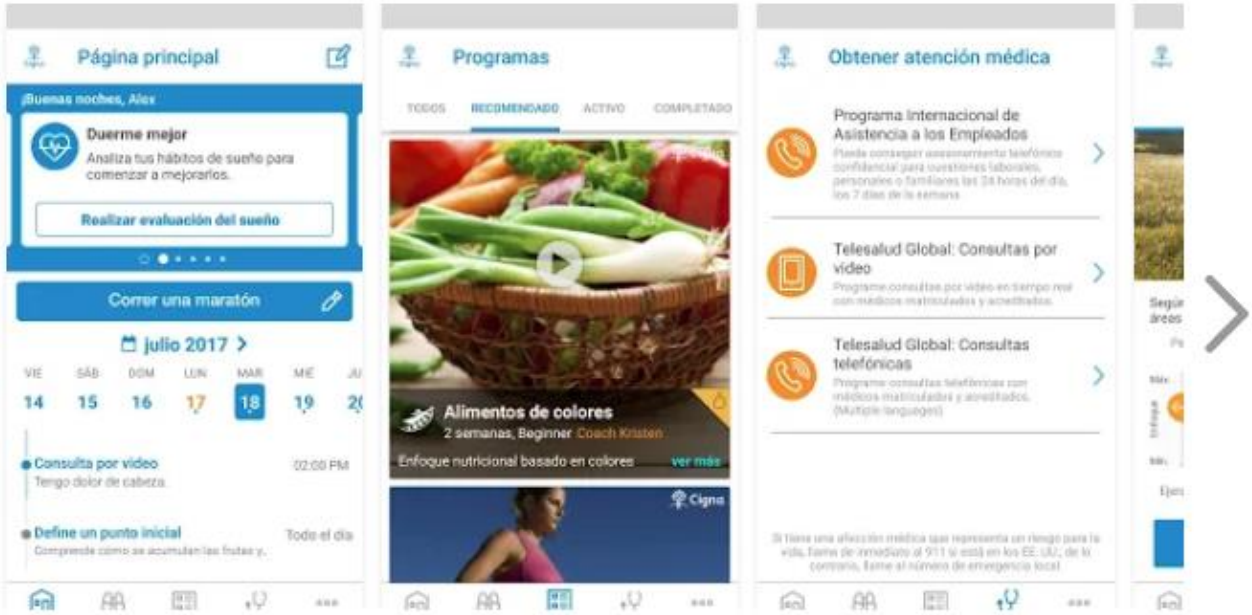
Cigna Wellbeing

Cigna **Salud y bienestar** ★★★★☆ 3

PEGI 3

Esta aplicación es compatible con todos tus dispositivos.

Añadir a la lista de deseos **Instalar**



WP3 objectives & tasks

WP 3 – Citizen Participation in health and well-being monitoring

Task 3.1 Review *of existing apps and tools on the monitoring of health and well-being*

Task 3.2 Incorporate communication and dialogue on radiation effects on health *within the App or tool (based on consultation from WP1)*

Task 3.3 Adapt the tools *identified to gather information on health and behaviour of populations exposed to radiation (based on stakeholders needs identified in WP1)*

WP4 objectives & tasks

WP 4 Concept and specifications of App(s) and/or tools

***Lead: WIV-ISP*;** Partners: IRSN, ISGlobal, ISS, experts: V. Chumak, Ph. Pirard, O. Bondarenko

Task 4.1 Development of guidelines/concept *for apps and tools*

Task 4.2 Development of specifications (including tutorials) *for the App(s) or tools, or if feasible,* ***development of*** *demonstration/****prototype App***

Task 4.3 Development of database management plan

Task 4.4 Economic evaluation *of the proposed approach*

WP5 objectives & tasks

WP5 Coordination and Dissemination.

Lead: ISGlobal, Partners: ISS, WIV-ISP, FMU

Task 5.1 Coordination

Task 5.2 Dissemination

Citizen-science participation

Definition of ***citizen-science***:

"**A citizen scientist** is a **volunteer** who collects and/or processes data as a part of a scientific enquiry"

by Jonathan Silvertowm

Source: Silvertowm, J. (2009). A new dawn for citizen science. *Trends in Ecology and Evolution*, 24(9): 467-471

Citizen-science participation

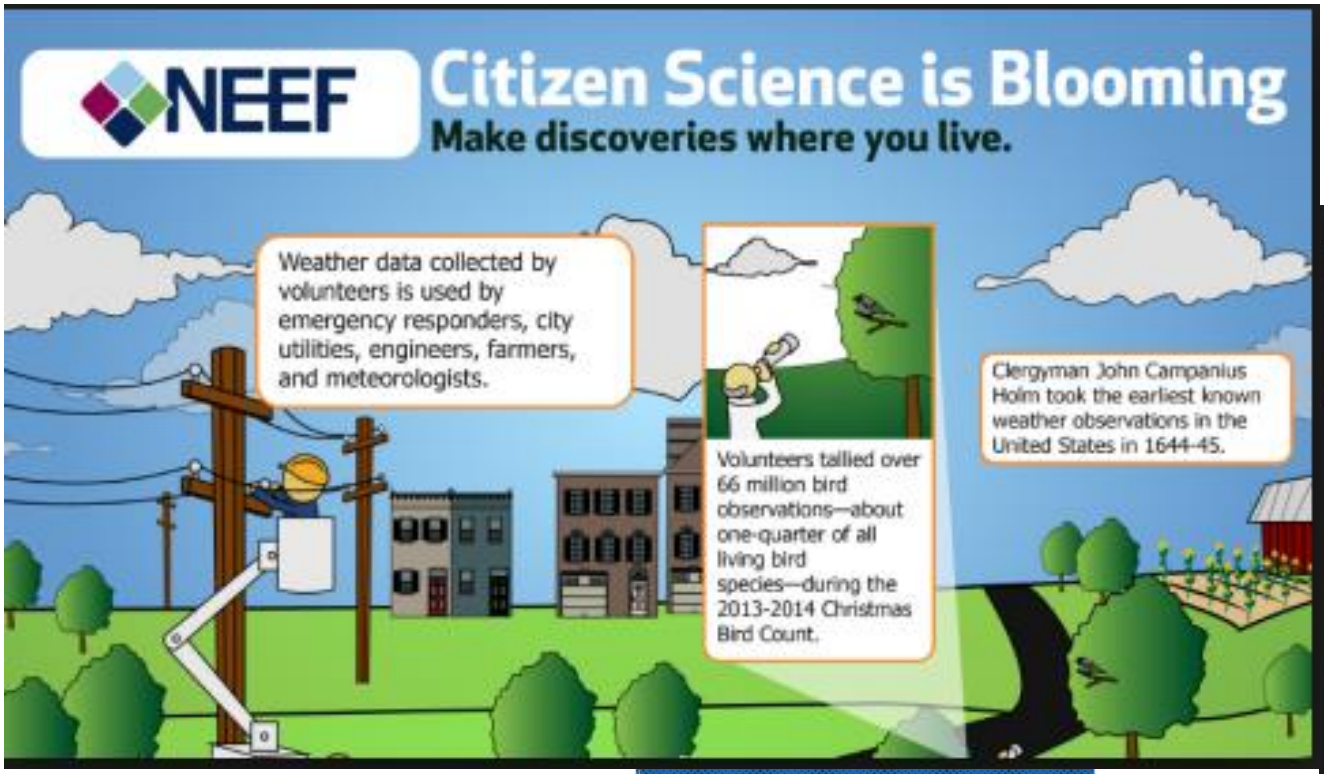
Some of the earliest projects:

USA (1900): *Christmas Bird Count* (run by the National Audubon Society)

UK (1932): The British trust for Ornithology was founded with a purpose of harnessing the efforts of amateur birdwatchers for the benifit of science and nature concervation -> contribution to the database held by National Biodiversity Network

More examples of projects on the next slide:


Citizen Science
STARDUST @ HOME
CLEAN BOATS CLEAN WATERS
vital signs
Operation Spider
Clean Annapolis River Project
NestWatch
redmap
REDMAP.ORG.AU
WILDLIFE WATCH
Great Swamp Watershed Association
nature's notebook
eBird
GREAT World Wide STAR COUNT
Operation Magpie
COAST
BIRD Sleuth
Project FeederWatch
Operation Bluetongue
ADIRONDACK INVENTORY ALL-TAXA BIODIVERSITY
Calflora
House Finch Disease Survey
Golden-winged Warbler Atlas Project
Birds in Forested Landscapes
FBC
Fresno Bird Count
The Last Ladybug Project
JAY WATCH
A CITIZEN-SCIENCE PROGRAM
RIS
www.CelebrateUrbanBirds.org
CORNELL LAB of ORNITHOLOGY
H2O CHELSEA
NYC Cricket
GREAT LAKES WORM WATCH
OAKMAPPER
Monitoring Sudden Oak Death
Project BudBurst
www.budburst.org
prbo
JOURNEY NORTH
TheCornellLab of Ornithology
Program Development & Evaluation


NEEF
Citizen Science is Blooming
Make discoveries where you live.
Weather data collected by volunteers is used by emergency responders, city utilities, engineers, farmers, and meteorologists.
Volunteers tallied over 66 million bird observations—about one-quarter of all living bird species—during the 2013-2014 Christmas Bird Count.
Clergyman John Campanius Holm took the earliest known weather observations in the United States in 1644-45.


Verizon
10:23 PM
79%
Blogger
BlogPress
PLoS
Citizen Science
Galaxy Zoo
Natur...ebook
CreekWatch
Project Noah
Counter
Observer
Roadkill
WildLab Bird
Redwoods
Tempe...Blast
Instant Wild
Starmap


CITIZEN SCIENCE
JOIN THE CLUB!
Citizen Science Club Summary:
The citizen science club connects middle school teachers and students with hands-on science projects – projects in which club members collect data for scientific investigations. The club is co-led by a math teacher and a science teacher. Club members will complete basic fieldwork at various sites in this fall, and will use winter club sessions to analyze data and create a related research question that can be investigated during spring field work.
Members will upload collected data, share experiences with other club members and analysis research projects posters at a research symposium late spring 2017.
JOIN TODAY!
How can I get involved? All students interested in becoming a Citizen Science Club member please contact:
Teacher Name in Room 123
NYC Department of Education

Citizens-science participation

Citizen-science in radiation field:

The results of peer reviewed publications show a small proportion (0.02%) related to radiation topic with citizen-science approach: 18 publications were detected by PubMed search with key words "citizen-science" or "citizen science" and "radiation" -
5 inputs with "nuclear disasters" and 2 for "dosimetry".

After checking the abstracts for their context, it was found the only relevant publication by Brown *et al.* (2016) concerning to the tool and program "*Safecast: successful citizen-science for radiation measurement and communication after Fukushima*".

J Radiol Prot. 2016 Jun 6;36(2):S82-S101. [Epub ahead of print]

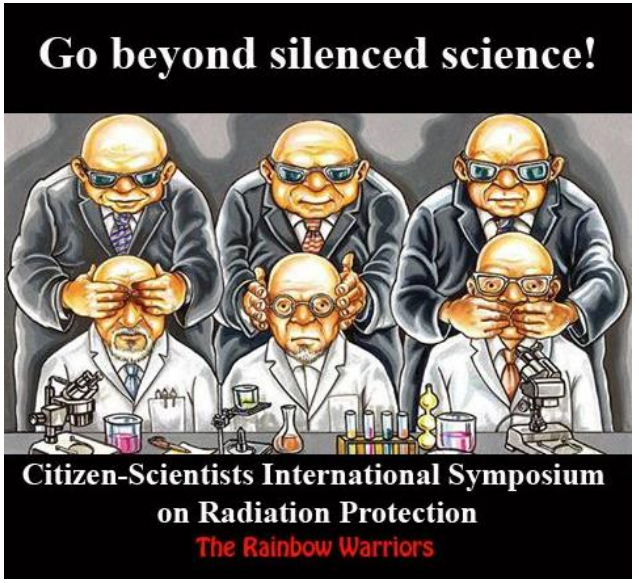
Safecast: successful citizen-science for radiation measurement and communication after Fukushima.

Brown A[1], Franken P, Bonner S, Dolezal N, Moross J.

Author information

Abstract

The Fukushima Daichi Nuclear Power Plant disaster, which began on 11 March 2011, provided a crucial opportunity to evaluate the state of preparation on the part the powerplant operator (TEPCO), relevant Japanese government agencies, and international oversight bodies, to gather necessary information on radiation risks quickly and to share it with those tasked with emergency response as well as with the general public. The inadequacy of this preparation and the chaotic nature of inter-agency and inter-governmental communication has been well noted in several official reports on the disaster. In response, Safecast, an international, volunteer-based organization devoted to monitoring and openly sharing information on environmental radiation and other pollutants, was initiated on 12 March 2011, one day following the start of the accident. Since then the group has implemented participatory, open-source, citizen-science-centered radiation mapping solutions developed through a process of collaborative open innovation. The information Safecast provided has proven useful to experts, to policy makers, and to the public. This paper briefly describes the methodology and toolsets Safecast has developed and deployed, as well as organizational and social aspects, and summarizes key results obtained to date. In addition, it discusses appropriate criteria for evaluating the success of citizen-science efforts like Safecast, and places it in context with other non-governmental radiation monitoring efforts.



Citizen-science participation in radiation

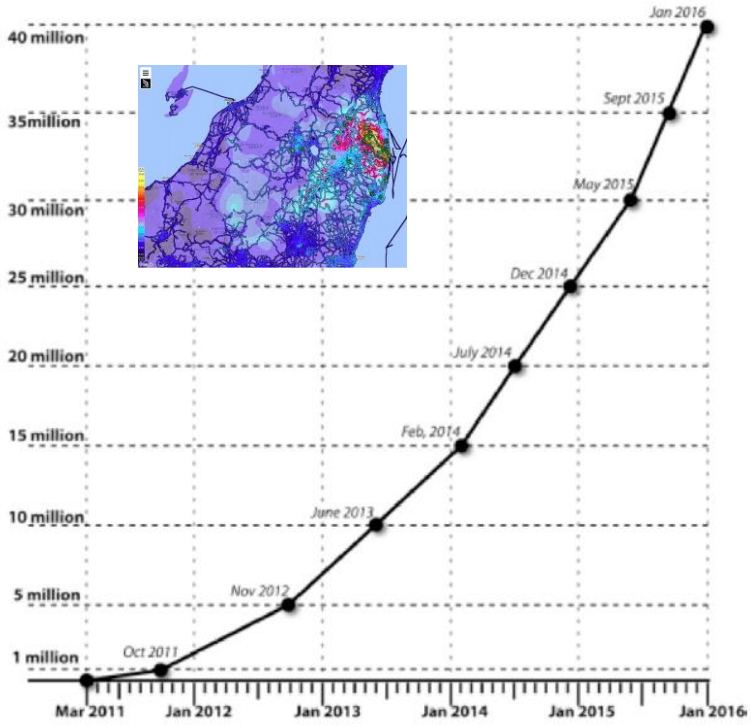
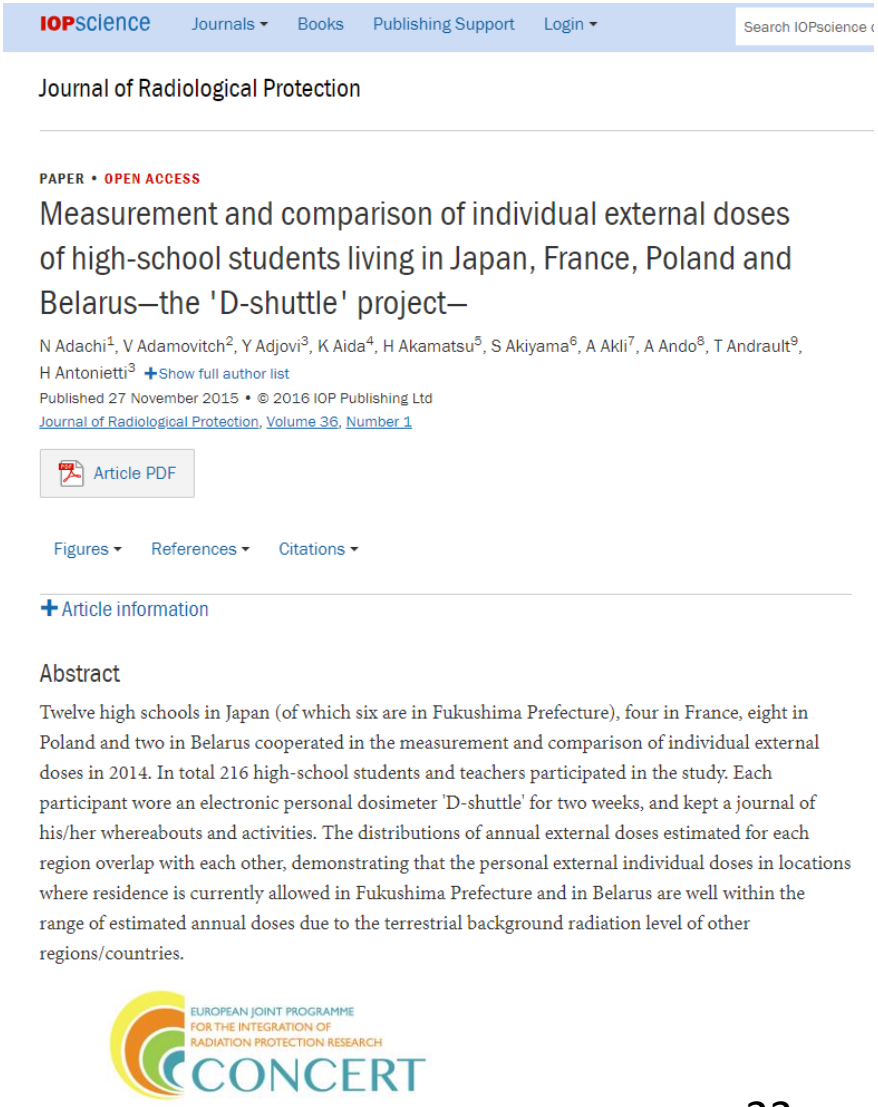


Figure 5. Growth of Safecast dataset.

Source: Brown et al. 2016

Citizens-science participation

Citizen-science in radiation field:



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Journal of Radiological Protection

PAPER • OPEN ACCESS

Measurement and comparison of individual external doses of high-school students living in Japan, France, Poland and Belarus—the 'D-shuttle' project—

N Adachi[1], V Adamovitch[2], Y Adjovi[3], K Aida[4], H Akamatsu[5], S Akiyama[6], A Akli[7], A Ando[8], T Andrault[9], H Antonietti[3] +Show full author list

Published 27 November 2015 • © 2016 IOP Publishing Ltd
Journal of Radiological Protection, Volume 36, Number 1

Article PDF

Figures References Citations

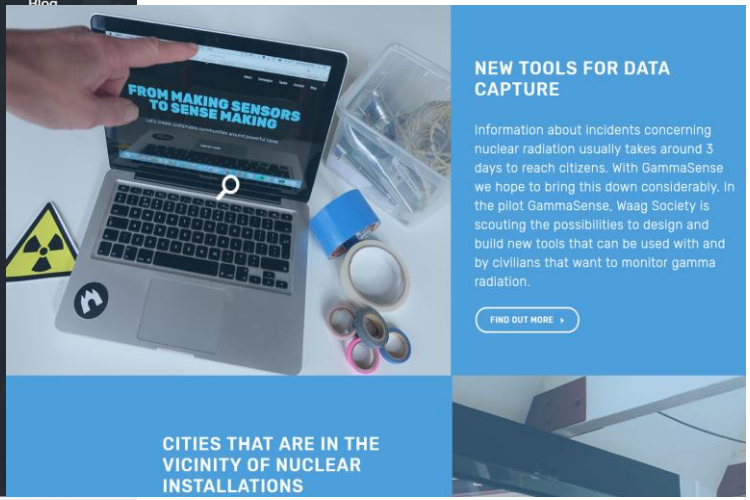
+ Article information

Abstract

Twelve high schools in Japan (of which six are in Fukushima Prefecture), four in France, eight in Poland and two in Belarus cooperated in the measurement and comparison of individual external doses in 2014. In total 216 high-school students and teachers participated in the study. Each participant wore an electronic personal dosimeter 'D-shuttle' for two weeks, and kept a journal of his/her whereabouts and activities. The distributions of annual external doses estimated for each region overlap with each other, demonstrating that the personal external individual doses in locations where residence is currently allowed in Fukushima Prefecture and in Belarus are well within the range of estimated annual doses due to the terrestrial background radiation level of other regions/countries.

Citizen-science participation

http://making-sense.eu/campaigns/gamma-sense/



75-100
PARTICIPANTS

Gamma Radiation
ISSUE

Amsterdam, Eindhoven, Maastricht, Bergen
LOCATION

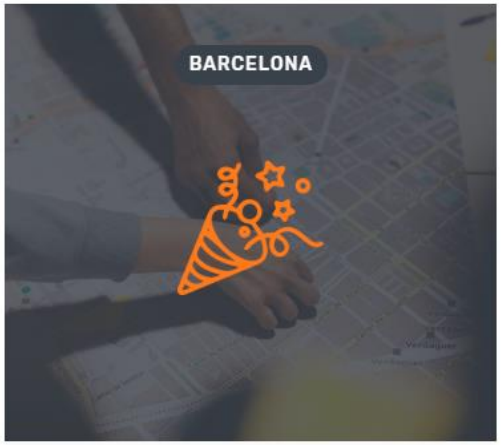
CO-CREATING CAMPAIGNS

The Making Sense project will orchestrate nine campaigns across Amsterdam, Barcelona and Kosovo.

Here's some of the work we've been doing

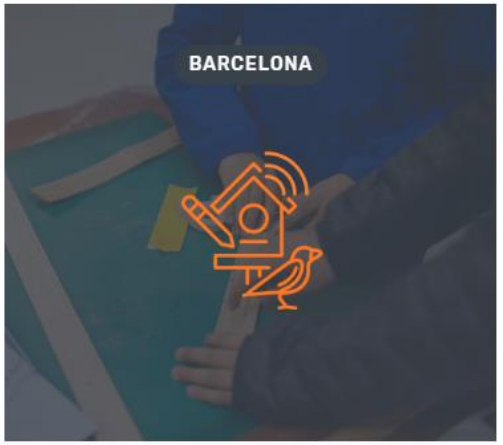
Gamma Sense

Co-creating new tools to measure and monitor gamma radiation



Plaça del Sol

Mapping noise in one of Barcelona's noisiest neighbourhoods



Fab Kids Lab

Exploring digital and analogue sensors to create feeders using bird-centered design

Citizen-science participation

https://ecsa.citizen-science.net/about-us

About us

The European Citizen Science Association (ECSA) is a non-profit association set up to encourage the growth of the Citizen Science movement in Europe in order to enhance the participation of the general public in scientific processes, mainly by initiating and supporting citizen science projects as well as performing research on citizen science. ECSA is framing citizen science as an open and inclusive approach, for example by supporting and being part of the exploration, shaping and development the different aspects of the citizen science movement, its better understanding and use for the benefit of decision making.

ECSA draws on +200 individual and organizational members from over 28 countries across the European Union and beyond. Launched during the EU GREEN WEEK in June 2013, ECSA has grown from an informal network of researchers and communicators interested in Citizen Science into the European reference network of Citizen Science initiatives. ECSA offers the opportunity to interact among groups and disciplines that already have or want to build a relation to citizen science, through activities in H2020 projects, contributing to policy briefs, the open science policy platform and being part of the development of principles for good practice in citizen science.

Citizen Science Global Partnership

EUROPEAN JOINT PROGRAMME FOR THE INTEGRATION OF RADIATION PROTECTION RESEARCH
CONCERT

ISGlobal Barcelona Institute for Global Health

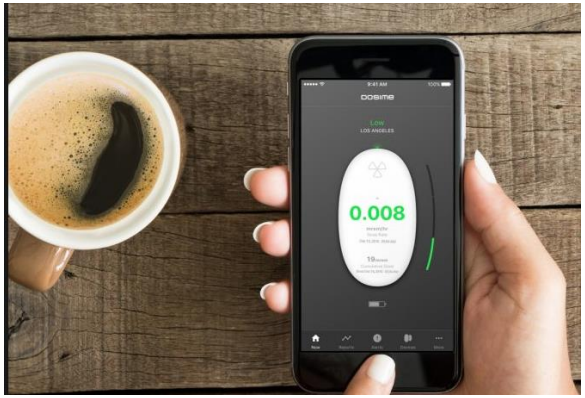
BENEFITS and CHALLENGES of Citizen-science participation

SHAMISEN SINGS Stakeholder Involvement in Generating Science After Nuclear Emergencies

Benefits:

-for projects & society (data gathering, awareness)

- for citizen-science participants (formation, information, awareness & control -> reduction of anxiety & related stress)



EUROPEAN JOINT PROGRAMME FOR THE INTEGRATION OF RADIATION PROTECTION RESEARCH CONCERT

BENEFITS and CHALLENGES of Citizen-science participation

Challenges:

- correct use of methods -> providing correct data (superficial contamination of tools, etc…)

- big data storage

THANK YOU!

A partnership of:

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Questionnaire for Exploring People's Needs for Apps (mobile applications) for dose measurements & health/well-being related to radiation exposure (WP1 SHAMISEN SINGS project)

Liudmila Liutsko[1-3] , Adelaida Sarukhan[1-3], Deborah Oughton[4], Paola Fattibene[5], Sara Della Monaca[5], Vadim Chumak[6], Aya Goto[7], Yuliya Lyamzina[7], Philippe Pirard[8], Natallia Noviakava[9], An Van Nieuwenhuyse[10], Yevgenia Tomkiv[4], Sylvie Charron[11], Mélanie Maître[12], Pascal Croüail[12], Thierry Schneider[12], and Elisabeth Cardis[1-3]; SHAMISEN SINGS Consortium

[1]ISGlobal), Barcelona, Spain; [2]CIBERESP, Madrid, Spain; [3]UPF, Barcelona, Spain; [4]NMBU, Ås, Norway; [5]ISS, Italia; [6]NRCRM NAMS, Kiev, Ukraine; [7]FMU, Fukushima, Japan; [8]Santé Publique France, Saint-Maurice, France; [9]ISEI of BSU, Minsk, Belarus; [10]KULeuven, Leuven, Belgium; [11]IRSN, Fontenay-aux-Roses, France; [12]CEPN, Fontenay-aux-Roses, France

Background: General Project description and goals

The SHAMISEN SINGS *(Stakeholders INvolvement in Generating Science)* EC-funded project.

In collaboration with relevant stakeholders (including the general population), SHAMISEN-SINGS aims to suggest how to improve existing tools that could be used widely (existing mobile applications, for example) or, if necessary, design new ones that enclose environmental and health monitoring for the affected populations after nuclear accidents, while assessing the ethical challenges and implications.

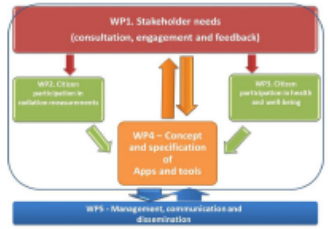

Figure 1. The structure of the SHAMISEN SINGS project.

Stakeholders Needs via the SHAMISEN SINGS Survey

WP1 (Work package 1) of the SHAMISEN-SINGS project includes the development of a questionnaire to gather the public opinion on "Needs on Apps (mobile applications) for dose measurements & health/well-being related to radiation exposure". This questionnaire was elaborated by partners and experts from Spain, Italy, Norway, France, Ukraine, Belarus and Japan. The original version of the questionnaire (in English) has been translated into other languages (Spanish, Italian, French, Ukrainian, Russian and Japanese) and is available at http://radiation.isglobal.org/index.php/es/stake-survey. The average time for completing is 5-10 minutes.

Figure 2. SHAMISEN SINGS web page with links to Questionnaires in different languages and first page of the English version of the Questionnaire.

Questionnaire scope and structure:
The questionnaire is divided into four main blocks.
The first concerns general data on survey participants: age group, sex, professional status, area of work or study, country and province/region of residence, level of education, and information about family nucleus (living with children or not, alone, etc.).
The second block is dedicated to self-assessment of knowledge and concerns about ionising radiation and sources. The participant is also asked whether or not he/she lives near a NPP (nuclear power plant).
The third block refers to the participant's potential interest in using mobile Apps for measuring dose, assessing health and obtaining information/advice. Here the acceptability to share data obtained from such Apps with other stakeholders (local authorities, doctors, etc.) is evaluated.
The fourth block is optional and targets only persons who have already had a radiological or nuclear emergency experience. Questions on past experiences such as access to information during the emergency and application of radiation protection measures in daily post-accident behavior are assessed.

Your voice is also important! Invitation to fill the Questionnaire and/or return any feedback:

Citizen-science is a very useful approach in post-accidental recovery and can be used successfully with wider applications. Involving local populations/stakeholders in gathering data about doses, providing them a perspective on their own dosimetric situation, reducing excessive anxiety and helping them to gain control over their daily lives in contaminated areas. It also provides important information to support dosimetric monitoring of affected territories, assisting in local decision-making processes and in information and training of the populations. It also helps to disseminate knowledge about radiation, protective measures and cultivate the radiation protection culture.

We invite you to add your own voice and complete the Questionnaire on-line helping us to identify better the population needs on mobile applications for dose measurements and health related issues.

Funding information, references and web sites:

SHAMISEN SINGS is funded by CONCERT (Agreement Nº 005/2017), EU Joint programme for the Integration of Radiation Protection Research.

SHAMISEN SINGS web: http://radiation.isglobal.org/index.php/en/shamisen-sings-home
SHAMISEN Project web: http://radiation.isglobal.org/index.php/ni/shamisen-project-//