# breathing games.net ™

Global report 2014 · 2022

In a nutshell

Ensuring that every human can afford a decent and healthy life is an individual duty.

It can be easily achieved if we mutualize resources to create knowledge and technologies that can be freely used, reproduced, adapted, improved.

Aiming co-created collective health

Play is a natural way to experiment, socialize, learn. Our community invites people to collectively create libre and open-source games and game controllers to foster mutual and self- care in respiratory and mental health.
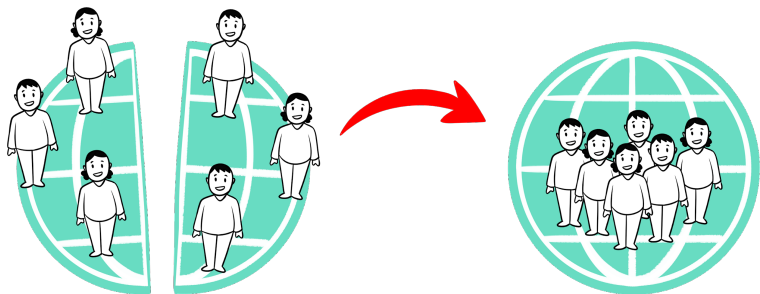
We bring together game designers, programmers, artists, people with respiratory and mental health experience, clinicians, and other passionate people. Together, we prototype games, develop an inclusive creation and research methodology, and mutualize resources to coordinate the initiative and root it local communities.

Valuing access to care
 – We create essential solutions with diverse communities who need them.
 – We mutualize resources and collaborate to avoid similar projects.
 – We ensure our work can be reproduced + improved freely by people.
 – We ensure that outcomes generated are shared among the contributors.
 – We validate accessibility and health outcomes with scientific methods.

Facts and figures

470	professionals and researchers mobilized across five countries
450000	viewers reached through broadcast and documentary
35000	hours of contributions
75	scientific communications
16	media interviews including the documentary A new Economy
320	K research funds and donations received
23	co-creation events organized
23	games prototyped
8	game controllers prototyped

Key affiliations

We are members of the

 – Global Alliance against chronic Respiratory Diseases (GARD WHO)
   a World Health Organization network of over eighty lung associations to reduce the burden of respiratory diseases, especially in poor regions.
 – Open Source Initiative
   a network of over eighty organizations advocating for open-source
 – International Geneva Welcome Center
   a support center for international civil servants and non-governmental organizations based in Geneva.
 – Après
   The network for the social and solidarity economy of Geneva

Principles

Since 2016, Breathing Games is a signatory of the UN GlobalCompact. We celebrate human life and the right to do meaningful activities. The first article of the Declaration of Human Rights leads our vision:

All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

We understand collectively created health knowledge and technologies as *the* way to promote self- and mutual care. To "ensure healthy lives and promote well-being for all at all ages" (UN Global Goal 3), we believe that all should become creators of the collective wellbeing, putting in *commons* our experience, and ideas.

We encourage individuals and peer-to-peer communities to build on our work through following principles.

Free software and open-source hardware

We use tools that respect the users' freedom to use and share them, and modify their source code and design, when such tools provide the functions we need, and do not require an excessive time to acquire them:

– GitLab for sharing our source-code and design
– GIMP for image edition
– NextCloud / OnlyOffice for collaborative documentation

Copyfair licences

Instead of an excluding copyright, we use licences that preserve the right to reuse and enrich knowledge and technologies if reciprocity is provided:

– GNU Affero General Public License 3.0 (Free Software Foundation)
– Attribution-ShareAlike 4.0 International (Creative Commons)
– Open Hardware Licence Strong Reciprocal (CERN)
– Peer Production Licence (P2P Foundation)

Accessible documentation

We document our co-creation process, the source code of software and designs of hardware created, and make this documentation freely accessible via:

– breathinggames.net
– gitlab.com/breathinggames
– full open access publications and repositories like Zenodo
– platforms to reach broad communities like Discord (gamer messaging)

Participatory research

To reduce power inequalities and encourage social transformation, we do research *with* the participants rather than *on* or *for* them. We consider that not to have a positive impact when being privileged is unethical.

Open governance and distributed data system

We log contributions in time, money and kind to acknowledge individual efforts towards the collective. This also provides a basis for traceability.

We aim to develop a distributed platform to mutualize and redistribute resources across a global community. This should help individuals find communities, merge ideas, develop glocal projects, do peer-reviewed quality control, and co-define how data is managed. See chart below.
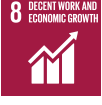
Agility

We foster transdisciplinarity. We take advantage of existing infrastructures, use a frugal approach, and develop low-tech products.

Thus, we build a coherent ecosystem: an open access commons increasingly capable of sustaining communities in developing and sharing health knowledge, fostering social justice, reducing inequalities.

Updated May 2021

Global goals

We contribute to the 2030 Agenda for Sustainable Development, adopted by the United Nations.

|	Goal	Target	Our contribution
3 GOOD HEALTH AND WELL-BEING	Ensure healthy lives and promote well-being for all at all ages.	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air […].	We actively encourage the population to co-design solutions that meet their real needs, hence taking ownership of their health, and health technologies.
		3.d: Strengthen the capacity of all countries […] for early warning, risk reduction and management of national and global health risks.	We provide members from the Global Alliance against chronic Respiratory Diseases with enjoyable tools that are easy to use, reproduce and adapt in low-resource settings.
1 NO POVERTY	End poverty in all its forms everywhere.	1.a: By 2030, ensure that all […] have equal rights to economic resources, as well as […] control over […] appropriate new technology […].	We provide a scalable, sustainable example of how people across countries, organizations and disciplines can cooperate to develop science-based innovation everyone can enrich.
4 QUALITY EDUCATION	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development […].	We ensure free access to educational tools and co-creation methods, and encourage vulnerable populations to develop skills to locally produce cheap and adaptable open hardware.
8 DECENT WORK AND ECONOMIC GROWTH	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	8.3: Promote […] policies that support productive activities, […] creativity and innovation […].	We foster a fair redistribution of resources among autonomous contributors to a collective project.
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	9.b: Support domestic technology development, research and innovation in developing countries […].	We foster mutualized, open-source innovation across countries as a way to reduce redundancies, products unfit to users, and planned obsolescence.
11 SUSTAINABLE CITIES AND COMMUNITIES	Make cities and human settlements inclusive, safe, resilient and sustainable.	11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality […].	We provide gratis and fun educational tools to foster awareness and dialogue about respiratory health and air quality, from childhood and across generations.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Ensure sustainable consumption and production pattern.	12.8: By 2030, ensure that people everywhere have the relevant information and awareness for […] lifestyles in harmony with nature.	We develop a data commons across countries, that is elaborated and managed with the participating communities.
17 PARTNERSHIPS FOR THE GOALS	Strengthen the means of implementation and revitalize the global partnership for sustainable development.	17.6: Enhance […] international cooperation on and access to science, technology and innovation and enhance knowledge sharing […].	We create new mechanisms of cooperation based on participatory research, peer-to-peer production and distributed governance.

Organization

One goal for the professionalization of our structure is to adopt an open governance model, and social impact indicators. This will allow us to scale up the initiative while keeping a structure that fosters open cooperation and transparent redistribution. Also read breathinggames.net/openvillage.

1 Ensure shared values among contributors
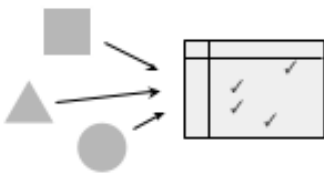
2 Reach consensus on common priorities

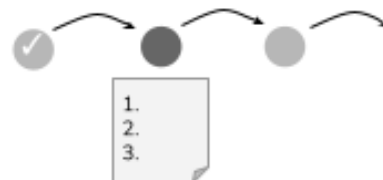Every human has access to essential care
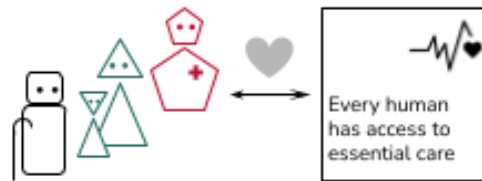
3 Find one's rightful place to contribute to the collective

4 Map existing projects and best practices

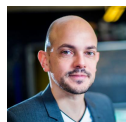5 Consolidate the work, prioritize steps to adoption

1.
2.
3.

6 Mutualize resources and allocate them fairly

Contributors

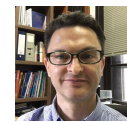## Key contributors   ☼ co-founders

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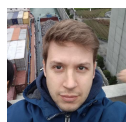
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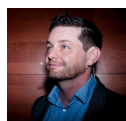
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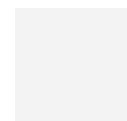
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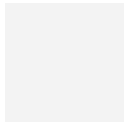
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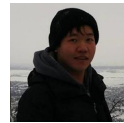
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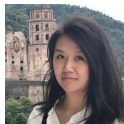
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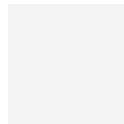
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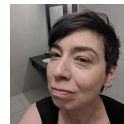
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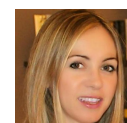Canada

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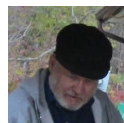
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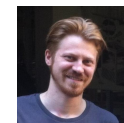
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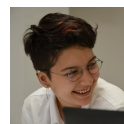
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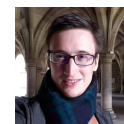
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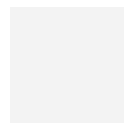
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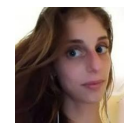
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Mobina Zali
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breathinggames.net

Collaborations

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Cochin university hospital	HX
Necker university hospital	HX
Fondation Arc-en-Ciel	HX
La Maison des Parents	I
French Hospitals Fed. – Fonds FHF	$
Grand Besancon Metropole	I

Italy

National Research Council – IBIR	HX
WeMake Milan	CX
OpenCare (European Union)	$

Switzerland

Geneva university hospitals	H
Geneva foundation against CF	$X
Geneva Health Forum	I
University of applied sciences HE Arc	IX
Lift	IX
Open Geneva Festival	I
Swiss Game Center	X
University of Geneva	I$X
A foundation	$

South Korea

Korea University	HX
Karl Polanyi Institute Asia	IX
SVS Fund	X
Yonsei University	$X
CityPreneurs	$

Canada

Blocksense	X
Sainte-Justine university hospital	HI$X
Quebec university hospital	HX
Sensorica	IX
Haply	IX
Ludociels pour tous	X
Canada Institutes of Health Research	$
Concordia University	I$X
Sustainability Action Fund	$

H hospital   I infrastructure $ funding   X expertise provided

Funding

The Breathing Games commons exists thanks to the time offered by our community – over four years full-time equivalent.

The funding received enabled us to organize co-creation events (mostly hosting, food, transportation), research, and ensure essential developments. The tables below give an overview of revenue and expenses by country since the beginning of the initiative. In-kind contributions are not included, except to a lesser extent for Canada (5630 CAD). Funds are managed via different structures, depending on the type of funding (donation, research grant, etc.).

Switzerland

Grants for co-creation, managed by the Breathing Games Association. External audit of accounting realized since 2019. CHF.

Expenses	49324.40	Revenues	49324.40
Game jams	21268.23	Foundation in Geneva	40000.00
Development	8446.95	BG France	9324.40
Partners	6908.00		
Web presence	3867.20		
Admin fees	3724.35		
Research	1281.00		
Covid loss	1100.30		
Banking fees	393.00		
Saldo	2375.37		

Funds managed by third parties. CHF.

Expenses	98400.00	Revenues	98400.00
Research	48400.00	Seed fund HE Arc	48400.00
Game jams	40000.00	Foundation in Geneva	40000.00
Co-facilitation	10000.00	Geneva U - partnership	10000.00

France

Grant for co-creation, managed via Balli's structure (requirement). EUR.

Expenses	54000.00	Revenues	54000.00
Game jams	16800.00	Fonds FHF	54000.00
Development	22080.00		
Devices	3106.00		
Taxes planned	10294.00		

Canada

Grants for co-creation and research, most managed by Concordia U. CAD.

Expenses	48556.27	Revenues	48556.27
Redistribution	23671.09	Forces Avenir	2000.00
Research	11418.00	CHU Ste Justine health pr.	2770.00
Travel	4580.24	CHU Ste Justine pneumo	3000.00
Food	3541.61	Concordia CCSL	4500.00
Electronics	3219.25	Concordia SAF	7800.00
Material	1477.08	Concordia GCBF	3000.00
Space	649.00	Concordia INDI	100.00
		Concordia CUAA	1000.00
		Can Instit Health Research	22530.00
		Breathing Games	2176.75
		Individual donations	420.00
		Transit BG	666.28

Italy

Grant for hardware, managed by WeMake. EUR.

Expenses	472.56	Revenues	472.56
Electronics	472.56	OpenCare	472.56

South Korea

Funds managed by third parties. KRW.

Expenses	12020000	Revenues	12020000
Co-facilitation	12020000	Yonsei U - partnership	12020000

2022

This year, we will host the second edition of the GHF Open Village as an off festival on "collectively taking care". We will also invite communities to play and build on our three core games, and new game pads.

2021

Important outcomes were achieved in 2021: Asthma Heroes and Asthmonautes were translated in 12 languages thanks to Guillaume Jeanmaire's network; two new gamepads were built by Richard Ibbotson, and a first Rise level was created by Felix Jeanmonnot. Two articles on clinical tests realized in Montreal were released thanks to Nicole Silva, Khadidja Chelabi, Sze Man Tse et al. Continuing support was provided by Yannick Gervais, Thomas Gaudy, Emmanuel Kellner and Charly Pache. We also mobilized and presented 15 respiratory health commons at the WHO GARD meeting.

Co-creation events (all online)

– April 24   Workshop, 'From discipline to cooperation', Open Edu Day
– Aug 24   Workshop 'Envisioning', Swiss Public Health conference
– Oct 12   Workshop 'The Great Renaissance', IASC general conf.
– Nov 26   Workshop 'Health Democracy', GDHub hackathon
– From May   GHF Open Village gatherings

Communications (all online)

– Jan 28   Presentation, World Summit on the Information Society
– Feb 3   Panel, Young European Biotech Network
– Feb 7   Panel, FOSDEM
– Mar 23   Panel, World Summit on the Information Society
– April 2   Journée innovation en santé, Cité des sciences
– May 6   Poster, Colloque méthodes mixtes francophonie
– May 18-19   Presentation, Réseau mère-enfant de la francophonie
– July 5   Presentation, Geneva-Tsinghua summer school on health
– Oct 6-7   Presentations, WHO GARD general meeting
– Oct 11   Talk, Geneva hub for Global Digital Health (GDHub)
– Nov 2   Podcast, GDHub

2020

We were invited to host a joint event for the Geneva Health Forum (global health congress) and Open Geneva (civil society hackathons). We hosted the 'Open Village,' a hands-on event to promote freely reproducible material for health. We created coronavirus-openkit.net to list hackathons and open-source material against covid. We also interviewed Prof. Pittet, who spread the alcohol-based hand rub patent-free, which saves 8 million lives yearly.

Regarding the games, we focus on developing the Rise. Asthma Heroes was also translated into Korean. Co-creation events planned in Paris and Besançon as well as different communications were also cancelled or postponed. We are also professionalizing our structure, and asked for an external audit of the Breathing Games Association bookkeeping for 2019.

천식히어로

시작하다
언어
일반 의약품
나가기
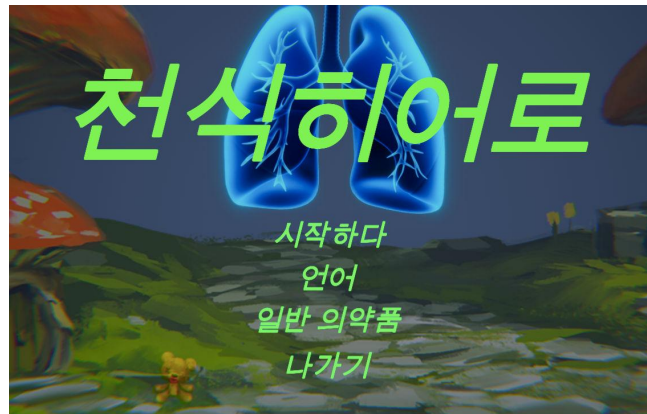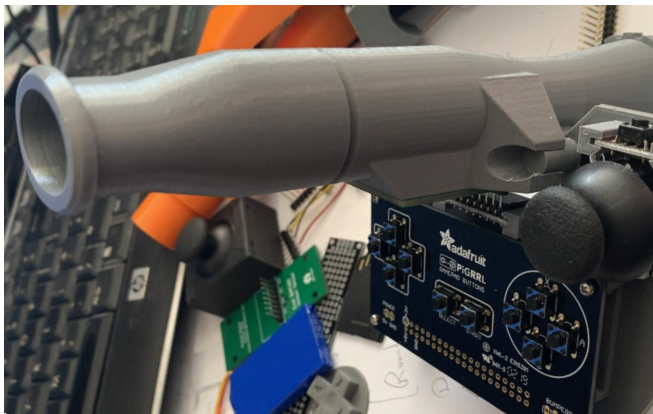
Co-creation events (all online)

 – Mar 21   Test of the Rise multiplayer, global
 – Apr 03-05   VersusVirus, Zürich
 – Apr 24-26   EuVsVirus, Brussels
 – Oct 11   Test of the Rise multiplayer, global
 – Nov 16-18   **GHF Open Village**, Geneva Health Forum, Geneva

Communications

 – Feb 3-5   Open Hardware from Academia Incubator, Bath
 – June 11   Workshop Public Health Schweiz, online

Play is, like oxygen, "all around us, yet goes mostly unnoticed or unappreciated until it is missing."

Dr Stuart Brown

We invite young adults in Paris to create games around their experience of cystic fibrosis. We clinically test games in Montreal and Palermo, and improve and validate our game controller in Paris, Geneva and Montreal. Our initiative is broadcasted on the Swiss telejournal (300000 viewers).
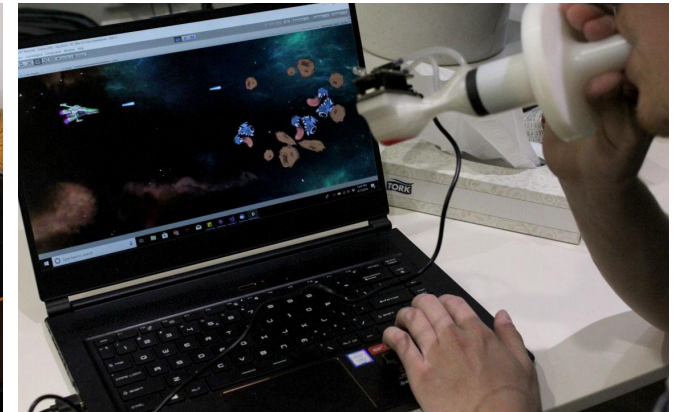
Co-creation events

- Mar 9-10   Clinical study, Sainte-Justine, Montreal
- Mar 17-18   Game jam, Necker hospital, Paris
- Mar 20-24   Game jam, OpenGeneva Festival, Geneva
- Apr 14-16   Hackathon team, Arkathon, Sion
- Jun 19-20   Micro game jam on virtual reality, Concordia U, Montreal
- Oct 13-17   Game jam, Fondation Arc-en-ciel, Besançon
- Oct 19-20   Game jam, Necker hospital, Paris

Communications

- Feb 27   Libraries colloquium on games and education, Montreal
- Mar 20   Panel, Meet the makers of a better world, Geneva
- Apr 11   Exhibition, World Summit on Info Society forum, Geneva
- Jul 5   Poster, Gamification & SG Symposium, Neuchâtel
- Jul 11   Serious Play Conference, Montreal
- Jul 31-Aug 5 Gathering Open Science Hardware, Toronto
- Aug 27-Oct 2 CityPreneurs, Seoul
- Sept 27   European nights of research, Palermo
- Oct 25-27   Poster, WHO GARD general meeting, Beijing
- Nov 25   Presentation, Tsinghua SDG OpenHack, Beijing

2018

This year, we continue to develop seven games – Asthmonautes, Respi Heroes, LungLauncher, Bloïd, PeakFlow, PeakLeap and TikiFlow, see page Games – that will be clinically tested in 2019.

Co-creation events

  – Apr 12-15   Game jam, OpenGeneva Festival, Geneva
  – Nov 5-13   Residence, Eco2fest, Montreal

Communications

  – Jan 13   Presenting to the research collective OMNSH, Paris
  – Apr 3   Webinar at McGill University Game Lab, Montreal
  – Apr 10   Quebec innovation week Sainte-Justine, Montreal
  – Aug 31   Poster, WHO GARD general meeting, Helsinki
  – Oct 12   Poster, Canadian Arts Therapy Conference, Montreal
  – Oct 26   Photograph for 50 years of planning at UdeM, Montreal
  – Nov 5   Presenting to PME MTL during Eco2fest, Montreal

2017

Breathing Games is funded by the Canadian Institutes of Health Research (strategy for patient-oriented research) and by the French Hospitals Federation (research and innovation fund). The first is a collaboration with Concordia University and CHU Sainte-Justine, the latter with Necker and Cochin hospitals.

Three game jams are held, as well as many scientific communications. A 3d-printed modular bed to test pressure and flow sensors is developed during a two-week maker in residence funded by the Horizon 2020 program of the European Union.

80 participants attend a screening of A new Economy, followed by a panel with social innovation experts Marguerite Mendell and Jean-Martin Aussant. The documentary is also released on Netflix. Breathing Games is also presented in an audio interview broadcasted by Les jeux sont faits.
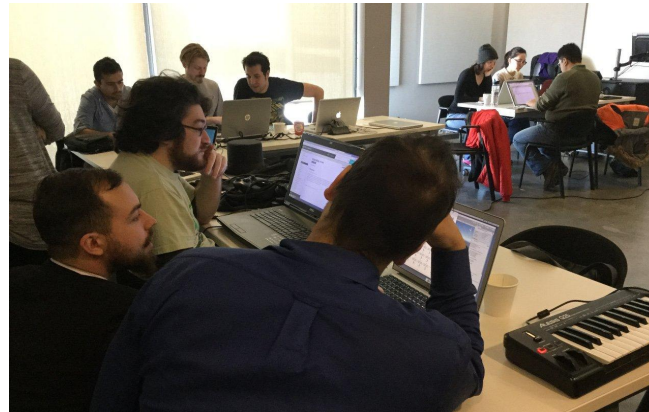
Co-creation events

– Feb 18-19   Game jam, Concordia U, Montreal
– Mar 1-3   Game jam, Lift:Lab, Geneva
– May 25-26   Workshops on blockchain, C2 Mtl, Montreal
– Jun 3-10   Game jam, Concordia U, Montreal
– Jun 21-Jul 8 Maker in residence OpenCare, WeMake, Milan
– Nov 30-   Keynote and workshops Collaborate and learn/teach
   Dec 2   differently, Concordia U + CHU Sainte-Justine, Montreal

Communications

– Mar 24   Presentation, Gathering Open Science Hardware, Chile
– Mar 24   Presentation, Global Goals Innovation Day, Geneva
– Mar 25   Presentation, Oxford U Global Challenge, Calgary
– Mar 25   Presentation, Concordia Education Symposium, Montreal
– Apr 12   Presentation, European Academy of Design, Rome
– May 10-12 Presentation and posters, ACFAS congress, Montreal
– Oct 6   Presentation on game jams, Lausanne U, Lausanne
– Oct 20   Presentation, OpenVillage Festival, Brussels
– Nov 3   Panel, Canadian Science Policy Conference, Ottawa
– Nov 9   Poster, WHO GARD general meeting, Brussels

2016

Breathing Games joins the Open Source Initiative, and becomes a signatory of the United Nations GlobalCompact, a commitment of organizations to "strive towards a world that benefits everyone, especially the future we borrow it from."

Three game jams are held. An engineering student creates a core for different games, which centralizes data collection, settings and therapy patterns. Interviews from 16 contributors are released on our YouTube channel.

In collaboration with the Lung Association of Québec, we apply to the Google Impact Challenge, a five million dollar grant to help ten initiatives tackle the biggest social challenges (not selected).
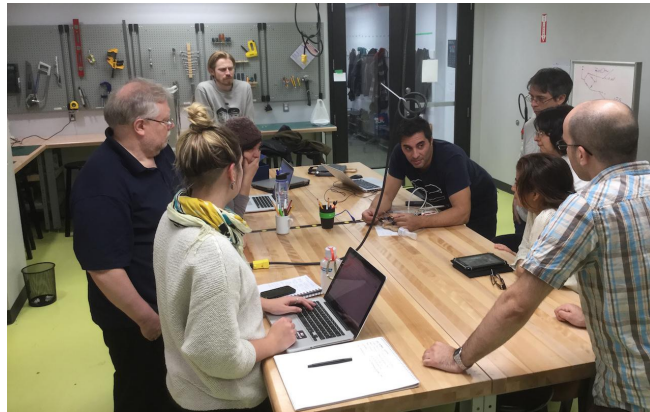
Co-creation events

– Feb 10-12   Game jam, Lift Conference, Geneva
– Aug 5-7   Game jam, Concordia U, Montreal
– Aug 10-12   Workshop Health & Play, World Social Forum, Montreal
– Nov 7   Workshop Open Hardware, Concordia U, Montreal
– Nov 12-13   Game jam, Concordia U, Montreal

Communications

– May 12   Presentation, ACFAS congress, Montreal
– June 9   Presentation, European CF Conference, Basel
– Aug 17-19   Workshop, Symposium on Open Collaboration, Berlin
– Oct 3   Poster, FRQS congress on respiratory health, Montreal
– Nov 21   Poster, Quebec annual public health days, Montreal
– Nov 22   Presentation, Mobile health apps colloquium, Montreal

2015

Eight researchers from the University of Applied Sciences Western Switzerland (Arc) start a study to evaluate the adequacy and cost of a serious game to increase respiratory compliance. We also collaborate with Sainte-Justine hospital to develop and test games for children who have asthma.

Breathing Games collaborates with Sensorica, a peer-production network specialized in open source hardware. We adopt its Value Accounting System, a platform that allows to log contributions in time, money or material and to redistribute funds with an equation.

An engineering student documents the cystic fibrosis practice in Switzerland and does a thorough reflection on the game design. Another engineering student adapts a software library to capture the noise made by mouthpieces used in cystic fibrosis treatment.

News about Breathing Games appear in national and regional CF newsletters in Spain. The team of Domain 7 follows Sensorica and Breathing Games for a documentary about "people making a fresh start towards building a new Economy."

Co-creation events

— June 5-7   Hackathon, Arkathon, Sierre
— Aug 28-29   Hackathon, Sensorica, Montreal

Communications

— June 11   Poster, European Cystic Fibrosis Conference, Brussels
— Oct 29   Presentation, symposium on collaboration, Montreal

Begin of the initiative as part of graduate studies in game design at Montreal University. Fabio Balli and Yannick Gervais build on the work done previously by John Danger. After developing the first prototype, a preliminary study is realized with ten children at Sainte-Justine hospital. The team is a finalist of Forces Avenir, which aims to recognize socially conscious students.

A website is created, and receives the certification "Health on the Net," which aims to foster quality, objective and transparent medical information.

A sociology student writes a dissertation about serious games, describing opportunities and limits of our initiative and another project. A blog article about the initiative is written by Canada Research Chair on Health Innovations.

Co-creation events

 – Feb 21-23   Hackathon, CHU Sainte Justine, Montreal
 – Nov 5-6   Hackathon, Montreal Summit on Innovation, Montreal

Games

Most games are developed on Unity as we have no resources to contribute to developing a free/libre engine like Godot.
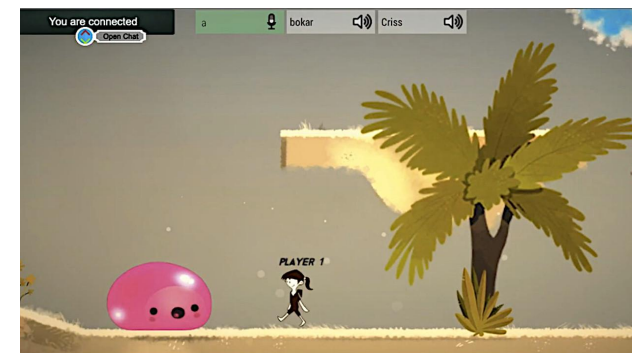
Games actively developed

Asthma Heroes
Preventing asthma attacks, 7-12 yo
90 min, Unity, Windows computer
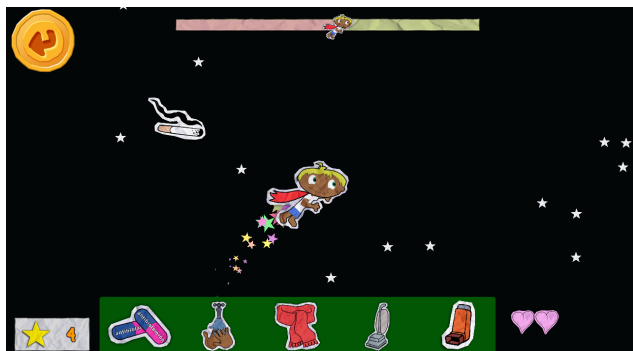**RC, tested – 13 languages**

Asthmonautes
Preventing asthma attacks, 11-16 yo
90 min, GameMaker, Windows computer
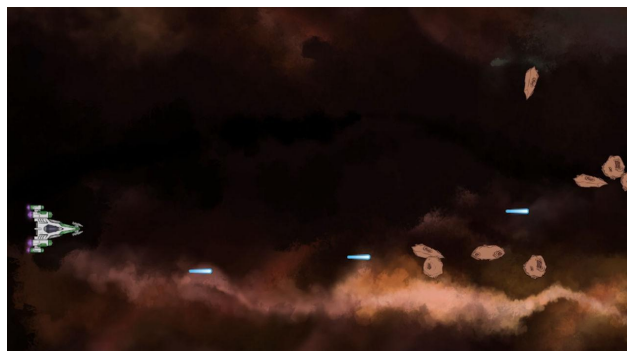**RC, tested – 14 languages planned**

Rise
Mutual care in respi and mental health, 7+ yo
1-4 players online, Unity, Windows computer
Alpha – English
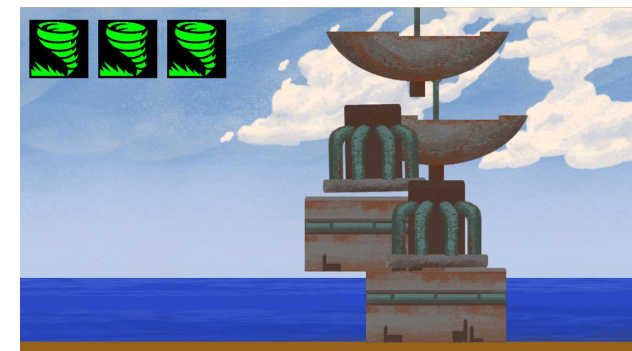
Games tested

LungLauncher
Prevention of asthma crises, 7-12 yo
4 minutes, Unity, Android smartphone
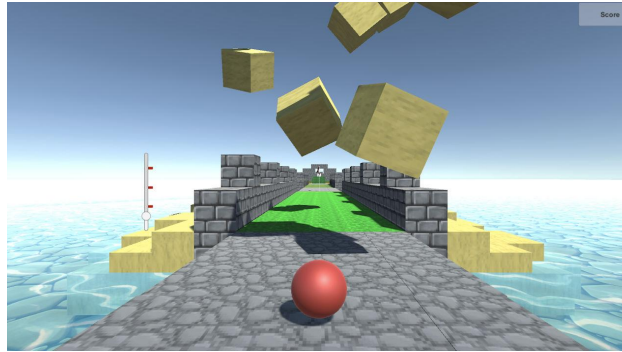**Tested – English and French**

Bloïd
Breathing exercise for stress reduction, 5+ yo
5 minutes, Unity, Windows/Mac computer
Tested – English

TikiFlow
Self screening of lung capacity (PEF)
5 minutes, Unity, Windows/Android tablet
Tested – English and French

Discontinued prototypes

Following games were discontinued to the benefit of more functional games.

PeakFlow – Self screening of lung capacity

PeakLeap – Self screening of lung capacity

VR game – Exploring art related to breathing

Mille-feuilles – Exercise to increase lung volume
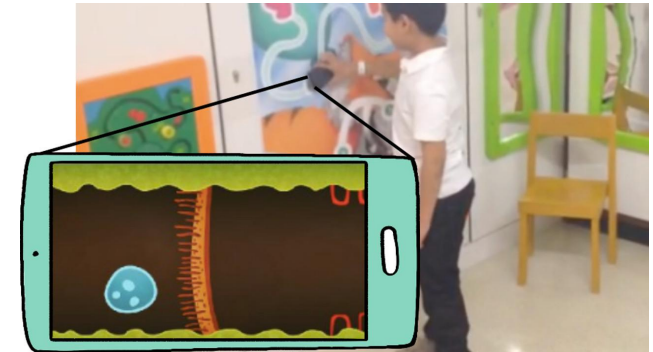
Pulmo – Respiratory health awareness
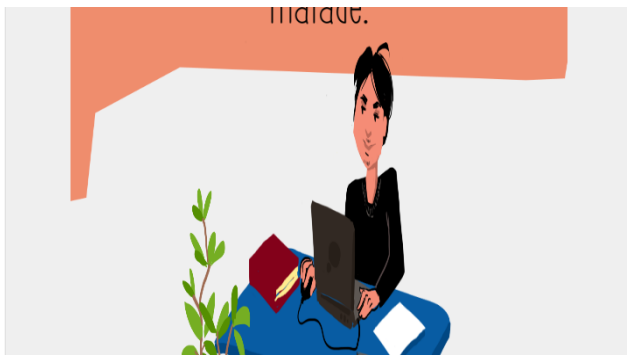
DicoSym – Mutual care in respi + mental health
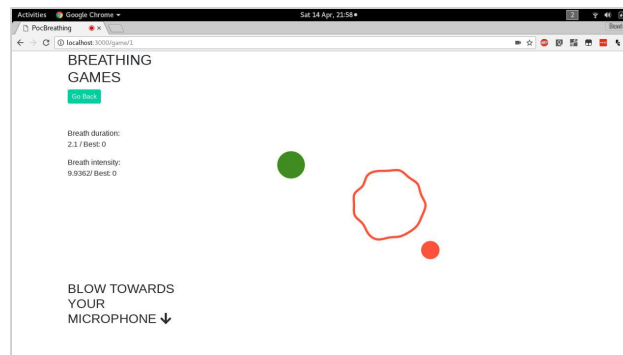
PocBreath – Breathing toy (on browser)
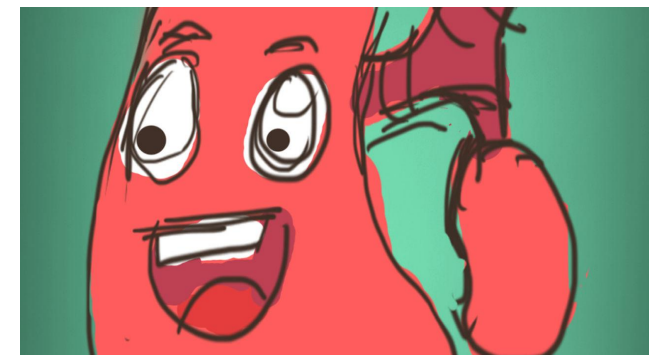
BreathingApp – Asthma medication follow up
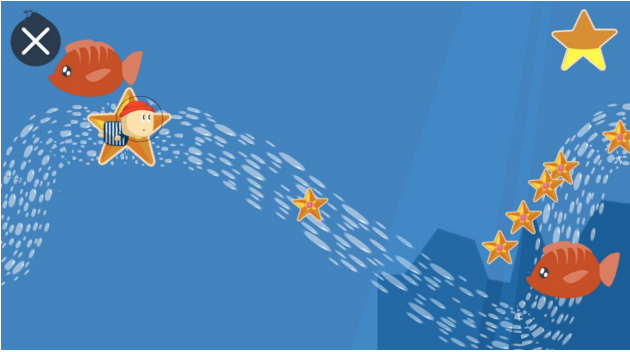
Heritages – CF airway clearance
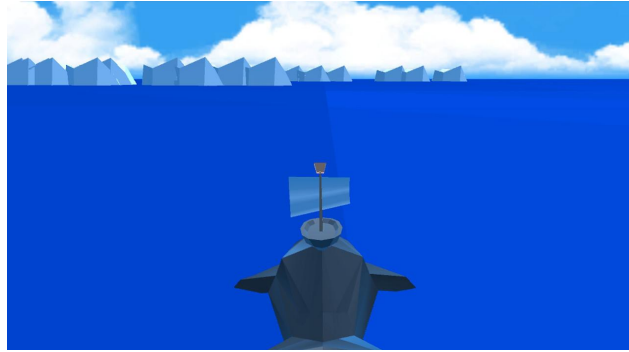
Les aventures du Briand – CF airway clearance
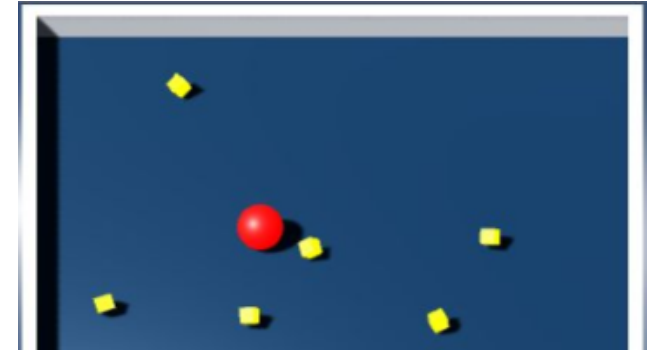
RollABall – CF airway clearance
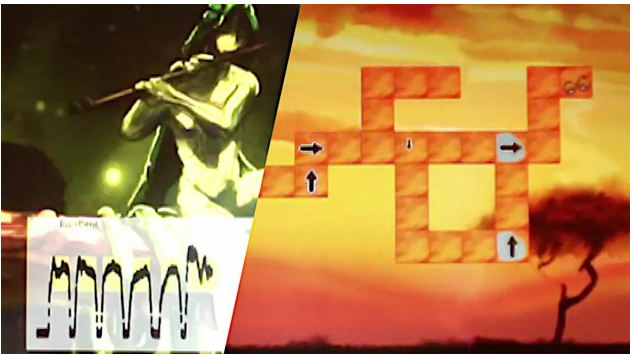
Globule – CF airway clearance
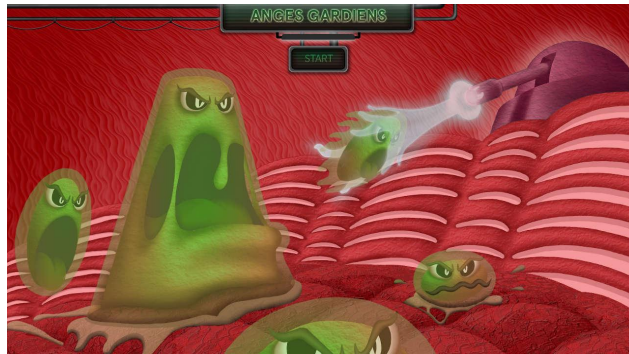
Ange-Gardien – CF airway clearance
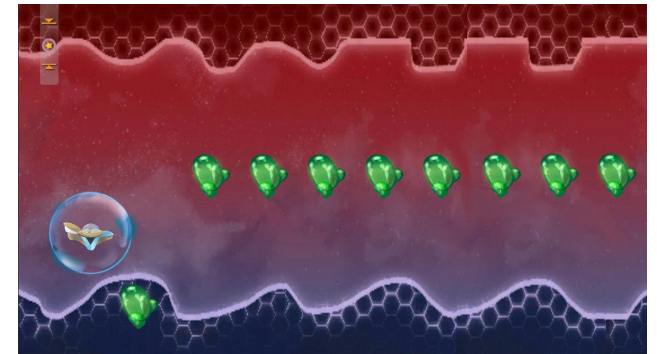
PEP Hero – CF airway clearance
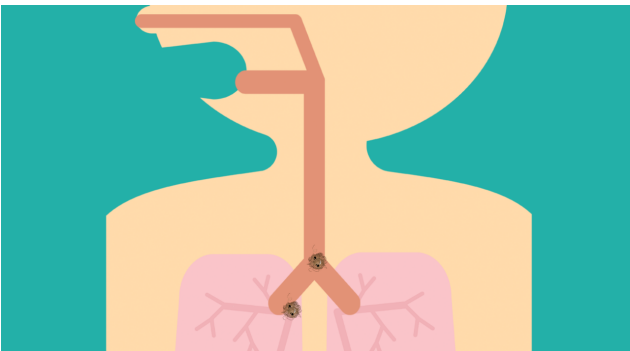
Pulmination – Removing allergens
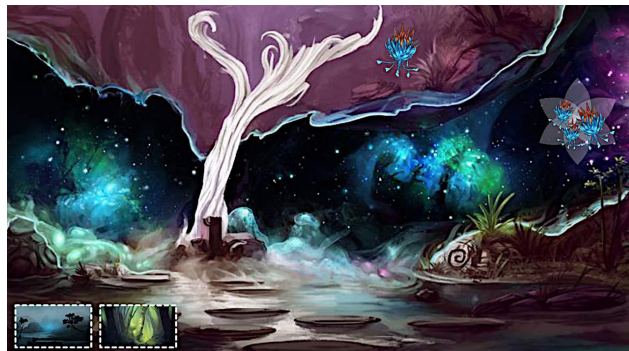
Celebrations – Respi health promotion (concept)
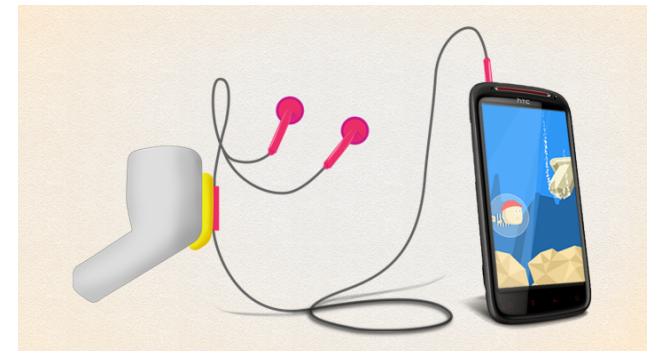
Sound library – Analyzing the noise

Hardware

Breathing gamepad [K]
Game controller measuring the flow and pressure, 3d-printed, Bluetooth and USB

Direct use
Actively developed

Spirotroller gaming [J]
Controller measuring the flow and pressure, 3d-printed, Bluetooth, three buttons

Direct use
Actively developed

Spirotroller enhanced [H]
Game controller measuring the expiratory flow, 3d-printed, Bluetooth and USB, three buttons

Direct use
Prototyped and tested

Spirotroller [G]
Game controller measuring the expiratory flow, 3d-printed, Bluetooth and USB, one button

Direct use
Prototyped

Led box [C]
Controller measuring the expiratory pressure, 3d-printed, Bluetooth and USB, 8x8 LED matrix

Use with mouthpiece
Prototyped

3D organic box [B]
Controller measuring the expiratory pressure, 3d-printed, USB, 1 LED

Use with mouthpiece
Prototyped
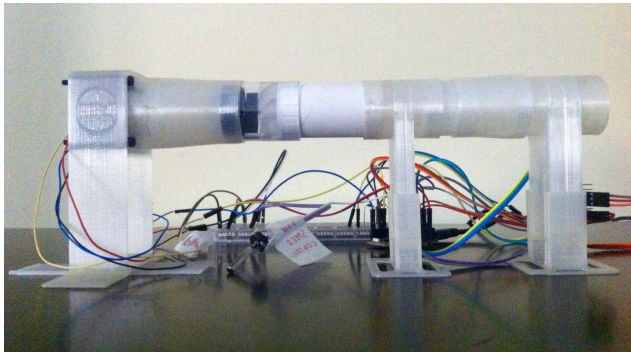
Modular test bench [F]
Bench including fan and modules to assess a variety of sensors in different settings

Direct use
Prototyped

Calibration syringe [E]
3 liter syringe for calibration

Use on controllers
Prototyped

GHF Open Village

Overview of the 2020 event initiated by Breathing Games and co-hosted with EchOpen, Aura, E-nable, LogAir to promote health technology as commons.

Download the synthesis in English, Français, Español, Português, русский, 中文, हिंदी, বাংলা, العربية.

enablingthefuture.org – hand prosthesis

osdd.net – open-source drug discovery
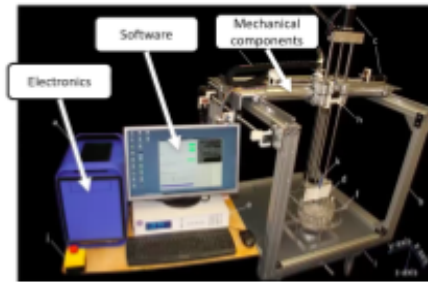
opensourceimaging.org – affordable MRI scan
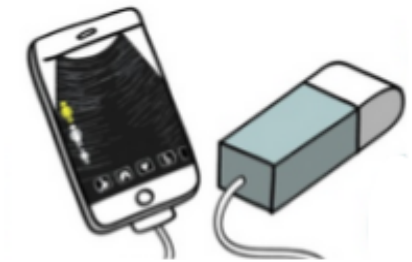
echopen.org – echo stethoscope

helpfulengineering.org quality process

open-source for health:
· trustable by design
· up to 90% cheaper
www.openvillage.ch

a ghf2020.org + opengeneva.org event with tondo.tech, joinseeds.com, santepop.qc.ca, yebn.eu

aura.healthcare, openhumans.org, cri-paris.org log and analysis of bio data to detect seizures

logair.io – crowdmap air quality
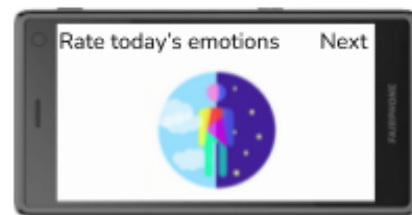
mindlogger.org – collect and visualize data

hoosh.space/fuga – gesture into sound

breathinggames.net – making care fun

15 open-source respiratory health commons introduced by Breathing Games at the WHO GARD workshop 'Innovation in chronic respiratory diseases'.

Download the presentation in English or watch the video.

Research

Time	Activity	Team	Organizations	Major funding
2021-now	n children with asthma test a game in different settings	Sze Man Tse, Myriam Bransi (Canada), Valérie Crijns (Belgium), Isabelle Sermet-Gaudelus (France), Stefania la Grutta, Laura Montalbano, Giovanna Cilluffo, Velia Malizia (Italy), Guillaume Jeanmaire (South Korea), Yousser Mohammad (Syria)	Sainte-Justine + Quebec + Necker hospitals, IBIR-CNR, Korea + Tishreen universities	–
2019-now	Combining air quality (fine dust) and breath sensing	Changsoo Kim, Jean-Henry Morin, Emmanuel Kellner, Fabio Balli	Yonsei and Geneva Universities, LogAir	UNIGE-Yonsei Seed Fund
2019-2021	Involving young adults with CF in creating games to foster self-care	Isabelle Sermet-Gaudelus, Pierre-Régis Burgel, Maya Kirszenbaum, Julie Valette, Marlene Clairicia, Aline Lustre, Damien Fangous, Fabio Balli	Necker and Cochin hospitals	French Hospitals Federation Fonds FHF
2019-2020	156 children with asthma test a flow-based game controller	Sze Man Tse, Myriam Bransi, Alena Valderrama, Fabio Balli	Sainte-Justine + Quebec hospitals, Concordia University	Canadian Institutes Health Research, Concordia U
2019-2020	Five children with asthma and their parent test four games	Sze Man Tse, Alena Valderrama, Maria Frangos, Fabio Balli	Sainte-Justine hospital, Concordia University	Canadian Institutes Health Research, Concordia U
2017-now	Interviews of contributors	Maria Frangos	Maria Frangos	–
2015-2016	Pre-study on serious games for cystic fibrosis → asthma	Christian Voirol, Aïcha Rizzotti, Typhaine Juvet, Gérald Huguenin, Stéphane Gobron, Nicolas Wenk, Calin Ionescu, Pauline Meyer, Fabio Balli	University of applied sciences Arc	Fonds d'impulsion HE Arc
2014	Ten children with CF test games with a pre-post survey	Annie Brochu, Nadia Marquis, Isabelle Tellier, Jacques-Édouard Marcotte, Sophie Laberge, The Thanh Diem Nguyen, David Duguay, Pascal Nataf, Yannick Gervais, Fabio Balli	Sainte-Justine hospital	–
2014-now	Documenting the co-creation	Various	Various	–

Publications

Book chapters

– Wu Ann, Tse Sze Man, Balli Fabio. Mobile Applications and Wearables for Chronic Respiratory Disease Monitoring. In Gomez JL, Himes BE, Kaminski N. **Precision in Pulmonary, Critical Care, and Sleep Medicine**. Humana Press 2020. DOI: 10.1007/978-3-030-31507-8.

Scientific articles

– Silva-Lavigne N, Valderrama A, Pelaez S, Bransi M, Balli F, Gervais Y, Gaudy T, Tse SM. Acceptability of serious games in pediatric asthma education and self-management: a pilot study. JMIR Pediatrics and Parenting 2021. https://doi.org/10.2196/33389

– Chelabi K, Balli F, Bransi M, Gervais Y, Marthe C, Tse SM. Validation of a game controller to assess peak expiratory flow against conventional spirometry in children: A cross-sectional study. **JMIR Serious Games 2020**; 9(1). https://doi.org/10.2196/25052

– Balli F. Developing Digital games to address airway clearance therapy in children with cystic fibrosis: participatory design process. **JMIR serious games 2018**; 6(4). https://doi.org/10.2196/games.8964

– Balli F. Game jams to co-create respiratory health games prototypes as participatory research methodology. **Forum: qualitative social research 2018**: 19(3). https://doi.org/10.17169/fqs-19.3.2734

Professional articles

– Balli F. Inspiring to play: Co-Creating Games for Respiratory Health in Montreal, Paris and Geneva. **Newsletter of the Global alliance against chronic respiratory diseases**; 2019; 2(2). https://gard-breathefreely.org/wp-content/uploads/2019/06/GARD-Newsletter-V2N2_FINAL_2019-06-19.pdf

– Brastaviceanu T, Lloyd T, Balli F. Production participative de matériel de recherche. In F Balli, J Lebel (eds). Recherche et communs : vers des sciences ouvertes. **ACFAS magazine 2019**. https://www.acfas.ca/publications/magazine/2019/03/production-participative-materiel-recherche

Reports and guidelines

– GARD members. Beijing call to action for lung health promotion. Global Alliance against chronic Respiratory Diseases 2019. https://www.gard-breathefreely.org/newsletterv1no6-2-3-6-2

Scientific abstracts

– Balli F, Jeanmaire G, Chelabi K, Kellner E, Gingras S, Gervais Y Méthodes mixtes, jeux, matériel ouvert et traduction en santé. In Gabrielle Chicoine, Pierre Pluye. **Théories et pratiques en méthodes mixtes : actes du 1er Colloque virtuel Méthodes mixtes francophonie (MMF) 2021**. http://mcgill-fammedstudies-recherchemedfam.pbworks.com/w/file/fetch/146220819/Actes-1er-colloque-MMF-virtuel_version%20finale_2021-09-20b-published.pdf

– Wenk N, Balli F. Breathing Games – Free/libre and open source games for respiratory health. **Gamification & serious game symposium 2019**; Jul 24; Neuchâtel, Switzerland.

– Frangos M, Balli F. Breathing Games: Promoting Respiratory Health Through Co-creation. **The Design Journal 2017**; 20(sup 1). https://doi.org/10.1080/14606925.2017.1352976

– Balli F. Health & Play – Addressing together the challenges of creating an open source standard for Breathing Games. In: **Companion to the proceedings of the 12th International Symposium on Open Collaboration; 2016** Aug 17-19; Berlin. ACM. https://doi.org/10.1145/2962132.2962138

– Balli F, Gomez V. Therapeutic adherence: exploring Open Collaboration to mobilize all stakeholders behind children with CF. **Journal of Cystic Fibrosis 2017**; 15(1). https://doi.org/10.1016/S1569-1993(16)30478-7

– Brochu A, Marcotte JE, Marquis N, Laberge S, Duguay D, Nataf P, Gervais Y, Balli F, Nguyen T. 2015. Video games for positive expiratory pressure (PEP) therapy in children with cystic fibrosis: a pilot study. **Journal of Cystic Fibrosis 2015**; 14(1). https://doi.org/10.1016/S1569-1993(15)30030-8

Scientific presentations

- Mendell M, Mattei U, Falcon L, Timm-Bottos J, Wazir R, Viatte B, Schull J, Laugeri M (co-hosts), Balli F (organizer). The Great Renaissance. Healing commons and tech for self-determination. **General conference of the International Association for the Study of the Commons; 2021** Oct 11-15; Phoenix, USA.

- Balli F. Co-creating health. Learnings from 20 game jams for health and the European hackathon against covid. **Geneve hub for Global Digital Health; 2021** Oct 11; Geneva, Switzerland. https://doi.org/10.5281/zenodo.5527044

- Balli F, Ibbotson R, Chhabra V, Pimentel JP, Suturin V, Falcon L, Timm-Bottos J, Kellner E, Menon J, Matringe M, le Couedic C Open-source respiratory health commons. 15 projects communities can adapt, repair, reproduce for low cost medical care (libre and open-source tech). **General Meeting of the Global Alliance against Respiratory Diseases; 2021** Oct 6-7. https://doi.org/10.5281/zenodo.5515632

- Balli F. Envisioning the future of public health: from online co-creation events to open science. **Swiss Public Health Conference; 2021** August 24; Bern, Switzerland. https://doi.org/10.5281/zenodo.5139594

- Balli F. Health technology and medical innovation: why open-source is vital. **Geneva-Tsinghua SDG Summer School; 2021** July 05; Geneva, Switzerland. https://doi.org/10.5281/zenodo.5053608

- Kirszenbaum M, Lustre A, de Beauvais N, Hauterive M, Wenk N, Gervais Y, Clairicia M, Frangos M, Gomez V, Burgel PR, Sermet-Gaudelus I, Valette J, Balli F. Favoriser le soin autonome : encourager les jeunes vivant avec la mucoviscidose à partager leur expérience à travers la création de jeux collaboratifs. **Réseau Mère-Enfant de la Francophonie; 2021** May 19; Lyon, France.

- Balli F. From discipline(s) to cooperation: five levers to transform education and research. **Open Education Day; 2021** April 24; Bern, Switzerland.

- Balli F. Building communities around a cause. **SDG innovation Bootcamp; 2019** Oct 25; Beijing, China.

- Balli F. Breathing Games On Air: Co-Creating a Board Game around the Breath. **Serious Play Conference; 2019** July 12; Montreal, Canada.

- Balli F, Frangos M. Respiratory health and air quality: fostering self and mutual care. **Gathering for Open Science Hardware; 2019** July 31; Toronto, Canada.

- Balli F. Des jeux qui inspirent : bien commun et innovation en santé. **Colloque jeux et éducation des Bibliothèques de Montréal et de la BAnQ; 2019** Feb 27; Montreal, Canada.

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- Balli F. Health & Play – Mobilizing citizens around breathing autonomy. **World Social Forum; 2016** Aug 3; Montreal, Canada.
- Balli F. Which psychosocial messages for a health game? **European Psychosocial Special Interest Group Meeting of the 39th European Cystic Fibrosis Conference; 2016** Jun 8; Basel, Switzerland.
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- Balli F. Co-creation during covid-19: prototyping health for everyone? **Public Health Switzerland; 2020** June 11; Bern, Switzerland.
- Balli F. Team-building and information flow for large groups such as online hackathons (Version 1.2). **EUvsVirus decision-making meeting; 2020** April 8, online. https://doi.org/10.5281/zenodo.3744376
- Balli F. Coronavirus hackathons: less efforts, more lives saved. **coronavirus-openkit.net; 2020** April 2, online. https://doi.org/10.5281/zenodo.3737898
- Balli F. Open Geneva and inclusion. **Fête de l'innovation; 2019** May 28; Geneva, Switzerland.
- Balli F. Breathing Games: population-driven health tech. **Eco2fest at PME MTL; 2018** Nov 5; Montreal, Canada.
- Dugas B, Balli F. Free/libre hardware. Conferenza OpenCare. **Digital Social Innovation and the Future of Care; 2017** Nov 22-23; Milano, Italy.
- Balli F. Jeux et matériel libres en santé respiratoire : enjeux de conception et de distribution. **Journée internationale du logiciel libre; 2017** Sept 16; Montreal, Canada.

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Scientific posters

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– Balli F, Fan LT. Health Education: Playing and Creating Games. Graduate Symposium in the Department of Education of Concordia University; 2017 Mar 25; Montreal, Canada.

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Panels

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– Balli F, Falcon L, Groh A (panelists), Sandler K (facilitator). Software and Hardware Freedom in Health Public Policy. FOSDEM; 2021 Feb 7. https://fosdem.org/2021/schedule/event/healthpublicpolicy/

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– Balli F, Dosemagen S, Knäpper I, Niggli N, Nimkar R (panelists), Michel S (facilitator). Geneva Solutions: Meet the Makers of a Better World 2019; Mar 20, Geneva, Switzerland.

– Brastaviceanu T, Balli F, Frangos M. Open Science and Innovation. 9th Canadian Science Policy Conference; 2017 Nov 3; Ottawa, Canada. https://youtu.be/fP32bzSh-fs

Exhibitions

– La Grutta S, Montalbano L, Gervais Y, Balli F. Notte europea dei ricercatori; 2019 Sept 27; Palermo, Italy.

– Frangos M, Balli F. Gathering for Open Science Hardware. **Public demo and seminar at the University of Toronto; 2019** July 31; Toronto, Canada.

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