

# Physical activity and sport recovery model in post COVID-19 period

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## Abstract

**Sport and physical activity is recognized as one of the triggers to economic and social development of societies, including physical training and education.** The Political Declaration of the 2030 Agenda reflects on "the contribution sports make to the empowerment of women and of young people, individuals and communities, as well as to health, education and social inclusion objectives" (WHO, 2017).

In this paper, the authors focus on the analysis of physical activity and sports recovery processes after the COVID-19 pandemic which has created profound challenges for youngsters and their family members. This research demonstrates forecasting incentives for correcting outdated sustainability models affected by COVID-19 and the rapidly increasing level of digitalization and use of technologies.

**Research outcomes show that the cancellation of any sports activities also impacts many social aspects such as quality of education, reduced mobility, limited social cohesion, lower emotional satisfaction, and excitement.** As follows, it leads to lower physical and mental activity among individuals, especially children and youth. At the same time, outcomes of system dynamics modelling of the latest data trends show that a recovery process of observed sports events is reasonably fast and, in the majority of cases, already reached a level of the pre-COVID-19 period with a tendency to positive further development.

The new system dynamics model is based on data gathered from organized sports events, case studies, practical tests, and research activities in Latvia and Albania. The conclusions made by the authors are useful for the teams and the institutions involved in the organization of outdoor sports events that would like to attract more participants, spectators, and tourists to their areas.

## Introduction

**Keywords:** socio-technical modelling, system dynamic, informal education, outdoor events, post COVID-19.

**Research objective:** Determine the impact of COVID-19 pandemic on the economic and social development trends of societies, enhancing informal physical training education (case study: sports event management system dynamics).

**Research question:** What are the major trends of recovery from COVID-19 pandemic impact for the economic and social development of societies, enhancing informal sports educational events.

## Methodology

**Combined methods used for specific research "Physical activity and sport recovery model in post COVID-19 period" purpose:**

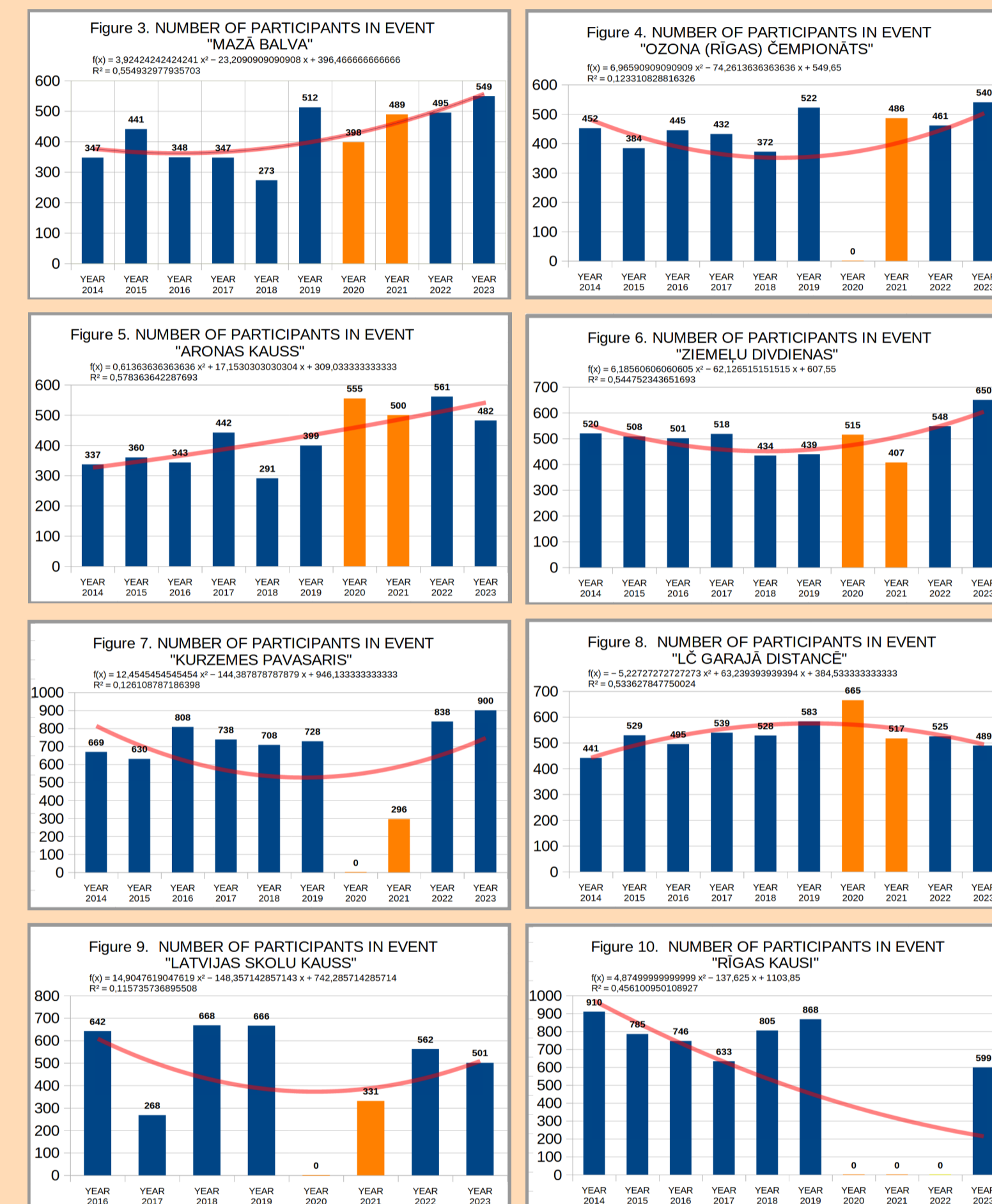
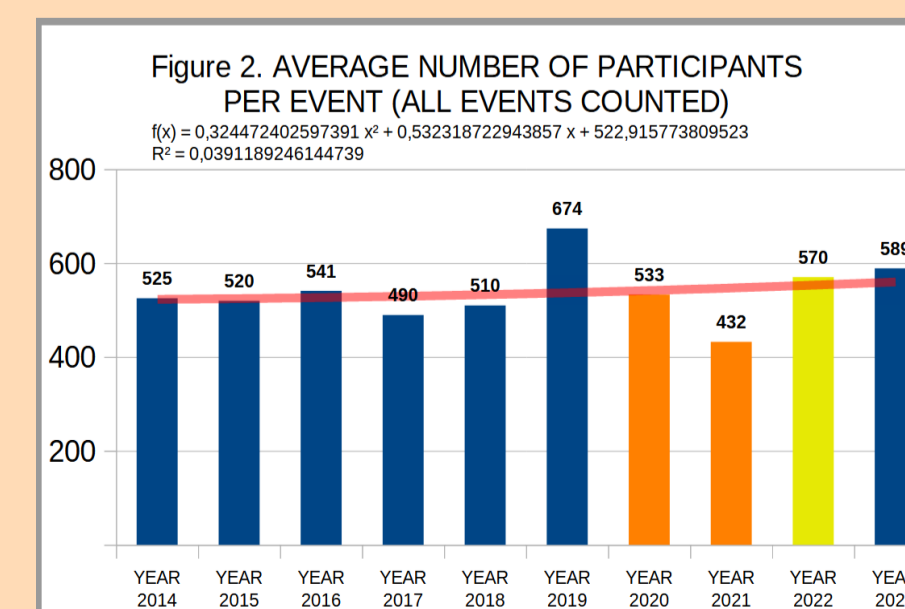
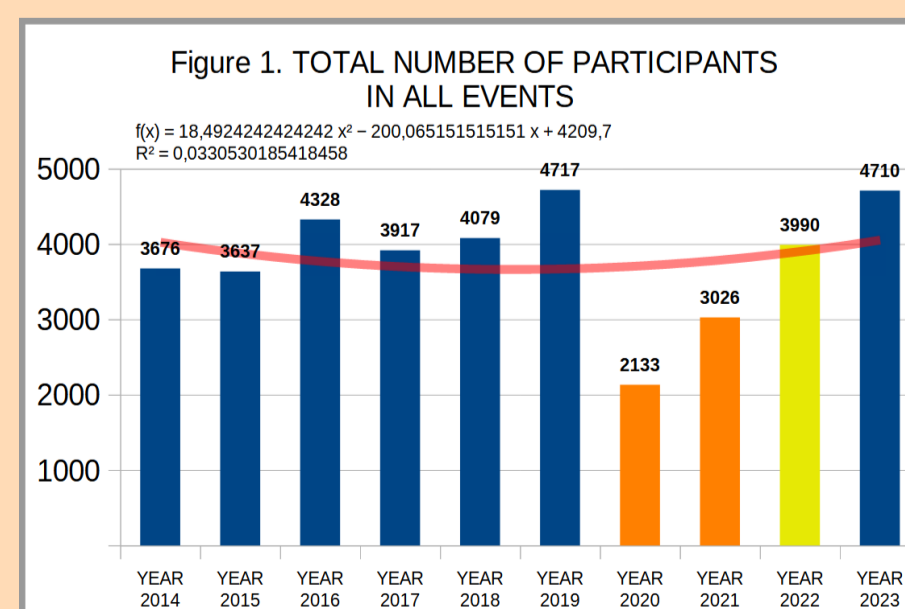
- 1) Theoretical literature review on the contribution what physical training and sports make to the enhancing education and social inclusion objectives for individuals and communities.
- 2) Analysed eight case studies how physical activity and sports recovery process is going after COVID-19 pandemic based on the available data sets collected and published on: <https://lof.lv/rezultati>.
- 3) All data collected in one data table for the period of the last 10 years for seven events and eight years for one event, all including three years period affected by COVID-19 pandemic.
- 4) For all eight cases statistically calculated as "trendlines" and found formulas for later use in STELLA system dynamic modelling tool as differential equations to simulate the current stage of recovery from COVID-19 pandemic period and further development forecasting.
- 5) From all data sets had been identified three special cases in Year 2020 when events had been postponed from regular spring activity period to the summer period with less or no-existent restrictions imposed by COVID-19.
- 6) From all data sets had been identified two special cases in Year 2021 when events had been provided in special "COVID-19" mode with respect of all restrictions imposed by COVID-19 procedures in Latvia.
- 7) Total trendline had been calculated statistically from all events 72 events (6 events not organised because of COVID-19 restrictions) during last 10 years
- 8) On the basis of calculated trendlines and their differential equations had been made a system dynamic simulation model in STELLA modelling environment for further forecasting of recovery process from restrictions imposed by COVID-19 period.

**Table 1. Analysed data of participants from series from events**

EVENT TITLE	YEAR 2014	YEAR 2015	YEAR 2016	YEAR 2017	YEAR 2018	YEAR 2019	YEAR 2020	YEAR 2021	YEAR 2022	YEAR 2023
Mazā Balva	347	441	348	347	273	512	398	489	495	549
Ozona (Rīgas) čempionāts	452	384	445	432	372	522	0	486	461	540
Aronas kauss	337	360	343	442	291	399	555	500	561	482
Ziemeļu divdienas	520	508	501	518	434	439	515	407	548	650
Kurzemes pavasaris	669	630	808	738	708	728	0	296	838	900
LČ garajā distancē	441	529	495	539	528	583	665	517	525	489
Latvijas Skolu kauss	N	N	642	268	668	666	0	331	562	501
Rīgas kausi	910	785	746	633	805	868	0	0	0	599
<b>IN TOTAL</b>	<b>3676</b>	<b>3637</b>	<b>4328</b>	<b>3917</b>	<b>4079</b>	<b>4717</b>	<b>2133</b>	<b>3026</b>	<b>3990</b>	<b>4710</b>
<b>AVERAGE PER EVENT</b>	<b>525</b>	<b>520</b>	<b>541</b>	<b>490</b>	<b>510</b>	<b>674</b>	<b>533</b>	<b>432</b>	<b>570</b>	<b>589</b>

**Special notes:**

0 events original data change  
2 events in limited "covid" mode

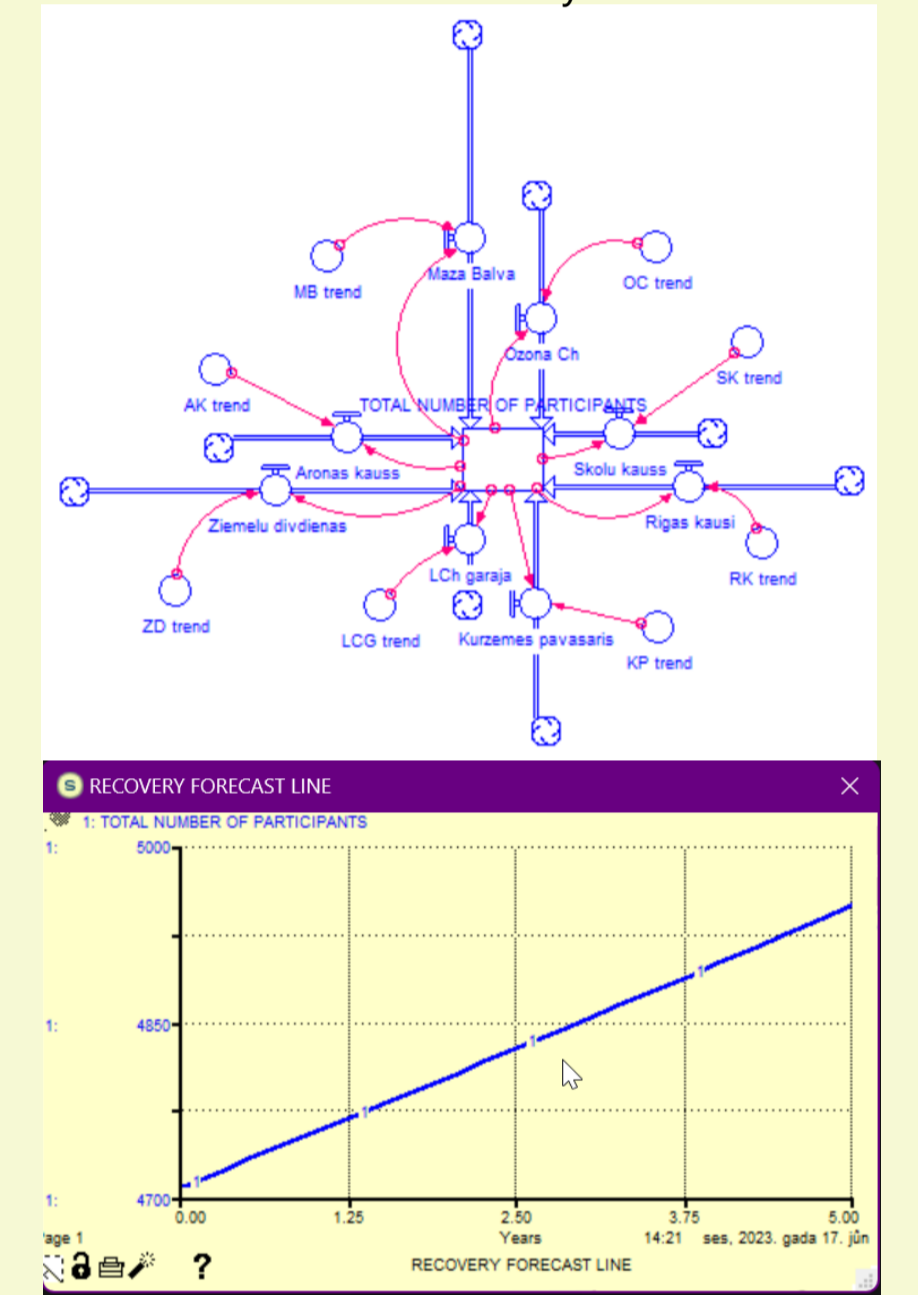


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## Results

Figure 11. Post COVID-19 Recovery model in STELLA



## Conclusions

Limitations imposed during the COVID-19 pandemic have impacted negatively most of analysed informal sports and physical training education quality.

Physical activity and sports events, in the most of analysed cases, have started showing the significant positive trends of recovery after three years into the COVID-19 pandemic.

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