Tracking Physical Activity from Adolescence to Early Adulthood: Decline and the Impact of the COVID-19 Pandemic

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Physical activity (PA) is a key component of health

- Early evidence: bus drivers vs bus conductors (Morris et al., 1953)
- Protective effect against many diseases (CVD, diabetes, cancer)

PA is a key modifiable behaviour for combatting obesity

- Increased PA $\rightarrow$ energy deficit $\rightarrow$ weight loss

PA levels decline over time

- Intn’l research suggests ~7% yearly reduction
- Decline continues into early adulthood
- Irish evidence of age-based difference: HBSC, Healthy Ireland
Impact of the COVID-19 Pandemic:

- **Restrictions**: limits on movement, social engagements and exercise facilities closed = barriers to PA

- **CSO** – early evidence of negative health impact:
  - Increased junk food, screen-time usage
  - **Exercise**: 37% doing more, 33% doing less

- **Sport Ireland report**:
  - Increase in **individual sports**: walking, running and cycling
  - Decrease in **team sports**
  - Data collected by mid-April 2020 – initial effect, sustained?
Q1. Do we observe a decline in PA from ages 9 to 20rs?

Q2. If so, what are the determinants of PA decline?

Q3. How has the pandemic affected PA levels of this cohort?

STUDY SAMPLE:

• GUI Cohort ’98
• Data collected at four main waves (9, 13, 17/18, 20yrs)
• N = 4,729
• Online questionnaire in Dec 2020 on COVID-19 experience (22yrs)
METHODS

Two questions about PA levels asked at all main waves

Q1. No. of times / fortnight you did ≥20mins of **moderate exercise**?
   • e.g. walking or slow cycling (including in PE)

Q2. No. of times / fortnight you did ≥20mins of **vigorous exercise**?
   • e.g. playing football, jogging or fast cycling (including in PE)

Calculate **MVPA minutes per week**
(moderate-to-vigorous physical activity)

COVID-19: Asked about changes in health behaviour

- Sports / physical exercise?
- Time spent outdoors?
- Drinking/smoking?
- Junk food consumption?
Fig 1 - Physical Activity Levels across all four waves of the study

- 21% reported increase / 76% decline
- Mean Difference = 111 mins/wk decline
- 31% reported 3hr+ reduction
### RESULTS

**Fig 2 – Adjusted Effect* on Mean Difference in PA between 9 & 20yrs**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean Difference in PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Sports at 17 (no)</td>
<td>49</td>
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<tr>
<td>Health (fair/poor)</td>
<td>43</td>
</tr>
<tr>
<td>Indiv. Sports at 17 (no)</td>
<td>38</td>
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<tr>
<td>Obese</td>
<td>37</td>
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<tr>
<td>Smoke Daily</td>
<td>24</td>
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<tr>
<td>Chronic illness (yes)</td>
<td>11</td>
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<td>Screen time (high)</td>
<td>11</td>
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</tbody>
</table>

**GREATER DECLINE IN PA**

*Adjusted for PA level at Age 9
RESULTS

Fig 3 – Adjusted Effect* on Mean Difference in PA between 9 & 20yrs

*Adjusted for PA level at Age 9
RESULTS – COVID-19

Fig 4 – Changes in Health Behaviours from Pre- to Mid-Pandemic

<table>
<thead>
<tr>
<th>Habit</th>
<th>Less (38%)</th>
<th>More (25%)</th>
<th>Less (44%)</th>
<th>More (24%)</th>
<th>Less (6%)</th>
<th>More (65%)</th>
<th>Less (11%)</th>
<th>More (45%)</th>
<th>Less (52%)</th>
<th>More (15%)</th>
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<tbody>
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<td>Exercise</td>
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<td>Screen time</td>
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<td>Junk food</td>
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Less exercise → most active pre-pandemic
- males
- non-smokers
- higher SES
- non-overweight
- sports’ participants
CONCLUSION

SUMMARY
• Significant decline in PA from childhood to early adulthood
• Predictors of PA decline: same as determinants of PA in childhood?
• COVID-19 has negatively impacted health behaviours, incl. exercise

LIMITATIONS
• Ideally use more robust measure of PA
• However, must consider increased cost

FUTURE RESEARCH
• Policies / interventions – increase PA or attenuate decline / what age?
• Longer-term effects of COVID-19 on PA (at 25yrs)?
THANK YOU

Many thanks to....

• My GUI colleagues and our colleagues at DCEDITY, TCD and CSO
• Huge thanks to all the GUI participants and their families

Questions, comments or feedback welcome.

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RESULTS

Table 1 - Mean difference in Physical Activity from 9 to 20yrs

<table>
<thead>
<tr>
<th>RANGE:</th>
<th>MVPA mins/wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction from 9 to 13yrs</td>
<td>103</td>
</tr>
<tr>
<td>Reduction from 13 to 17/18yrs</td>
<td>-13</td>
</tr>
<tr>
<td>Reduction from 17/18 to 20yrs</td>
<td>11</td>
</tr>
<tr>
<td>Total Reduction from 9 to 20yrs</td>
<td>101</td>
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</tbody>
</table>

Fig 2 - Mean difference in Physical Activity from 9 to 20yrs

- Increased PA: 21%
- No Change: 3%
- Reduction: 0-1hr: 16%
- Reduction: 1-2hrs: 13%
- Reduction: 2-3hrs: 16%
- Reduction: 3hrs+: 31%