Data Article

Dataset of consumer-based activity trackers as a tool for physical activity monitoring in epidemiological studies during the COVID-19 Pandemic

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A B S T R A C T

Physical activity (PA) data were downloaded from 113 participants who owned a Garmin or Fitbit activity tracker in 2019 and 2020. Upon participant authorization, data were automatically downloaded from the Garmin and Fitbit cloud storages. The mSpider tool, a solution for automatic and continuous data extraction from activity tracker providers, were used to download participant data. Available data are daily averages by year, as well as monthly averages between 2019 and 2020, for steps, activity energy expenditure (AEE), total energy expenditure (TEE), moderate-to-vigorous physical activity (MVPA), light PA (LPA), moderate PA (MPA), vigorous PA (VPA), and sedentary time. In addition, March 2020 was divided in two, giving the daily average before and after the Norwegian COVID-19 lockdown date. Raw daily values for these variables are also included in a separate file. In addition, daily values for non-wear time are also include as raw data.

In a previous study, differences between months, i.e., comparing 2019 with 2020 for months between March to December, were analysed for steps, MVPA, and AEE [1]. Fur-

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ther insights may be achieved by exploring other variables. This includes: (1) monthly averages for TEE, LPA, MPA, VPA, and sedentary time, (2) yearly averages (2019 and 2020) for steps, MVPA, TEE, AEE, LPA, MPA, VPA, and sedentary time (3) monthly average for steps, MVPA, TEE, AEE, LPA, MPA, VPA, and sedentary time for January, February, and March 2019, as well as March 2020. Additional analysis can also be conducted on the raw data.

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### Specifications Table

| Subject | Health informatics |
|---------|-------------------|
| Specific subject area | Change in physical activity levels during Norwegian COVID-19 lockdown. |
| Type of data | Table |
| How the data were acquired | Data were downloaded directly from the Fitbit and Garmin cloud storages. The mSpider tool, a solution for automatic and continuous data extraction from activity tracker providers, were used to extract historic data as well as future data from the day of participant registration. Upon registration, participants were asked to authorize access to the mSpider tool, by using open authentication provided by the vendor system (i.e., Fitbit/Garmin). |
| Data format | Raw, Analysed |
| Description of data collection | Participants were recruited through Norwegian media outlets. People who already owned an activity tracker from Garmin or Fitbit were eligible for inclusion. Two years of data (2019–2020) were automatically downloaded from consenting participants by directly accessing the Garmin and Fitbit cloud storages. The mSpider tool described in Henriksen et al. (2021) [1] were used to automate data downloading. Data were stored anonymized after download. |
| Data source location | Institution: UiT The Arctic University of Norway |
| | City/Town/Region: Tromsø/-/Troms |
| | Country: Norway |
| | Latitude and longitude for collected samples/data: Norway |
| Data accessibility | Repository name: DataverseNO |
| | Data identification number: doi: 10.18710/TGGCSZ, Direct URL to data: [https://dataverse.no/dataset.xhtml?persistentId=doi:10.18710/TGGCSZ](https://dataverse.no/dataset.xhtml?persistentId=doi:10.18710/TGGCSZ) [2] |
| Related research article | A. Henriksen, E. Johannessen, G. Hartvigsen, S. Grimsgaard, L. A. Hopstock, Consumer-Based Activity Trackers as a Tool for Physical Activity Monitoring in Epidemiological Studies During the COVID-19 Pandemic: Development and Usability Study. JMIR Public Health Surveill, 2021. 7(4): p. e23806. doi: [https://doi.org/10.2196/23806](https://doi.org/10.2196/23806) [1] |

### Value of the Data

- These data are useful because they give insight in how physical activity levels changed in the population due to the Norwegian COVID-19 lockdown.
- Researchers who wish to confirm results or perform more complex analysis on variables used in the affiliated publication, may benefit from these data.
- The dataset also includes monthly averages for TEE, LPA, MPA, VPA, and sedentary time. These were not included or addressed in the affiliate publication.
- Further insights may be achieved by doing more complex statistical analysis on the monthly averages presented in the affiliated publication (for Steps, MVPA, AEE).
Further insights may be achieved by analysing variables not used in the affiliated publication. These includes (for each participant): 1) activity tracker provider, 2) monthly averages for TEE, LPA, MPA, VPA, and sedentary time, 3) yearly average for 2019 and 2020 for steps, MVPA, TEE, AEE, LPA, MPA, VPA, and sedentary time, 4) monthly averages for steps, MVPA, TEE, AEE, LPA, MPA, VPA, and sedentary time for January, February, and March 2019, as well as March 2020.

Further insight may be achieved by analysing the raw data which the analysed variables are based on. This includes daily values for steps, MVPA, TEE, AEE, LPA, MPA, and VPA, as well as sedentary time and non-wear time.

1. Data Description

Data were collected from 113 participants who shared their physical activity data using privately owned activity trackers (or smart watches) from Garmin and Fitbit Table 1, provides summary statistics of the 106 participants who responded to an anonymous questionnaire asking about height, weight, age, and gender. Individual participant characteristics were unable to be paired to their respective PA data.

The dataset is stored at DataverseNO [2] and contains two files (“data.csv” and “data raw.csv”), in addition to a readme-file (“00_ReadMe.txt”) which describes the content of the files in the dataset.

The “data.csv” file contains 224 physical activity related variables, in addition to participant ID and provider name. The data consists of up to two years (2019-2020) of daily average values, grouped by month, for steps, total energy expenditure (TEE), activity energy expenditure (AEE), moderate-to-vigorous physical activity (MVPA), light PA (LPA), moderate PA (MPA), vigorous PA (VPA), and sedentary time. In addition to daily averages for each month, daily averages for 2019 and 2020, for each physical activity outcome, are also included. Finally, separate variables for the first and second half of March 2020 (before- and after the COVID-19 lockdown date in Norway in 2020) are included Table 2. gives a description of all variables included in the “data.csv” dataset.

The “data raw.csv” dataset is the raw data used to generate the variables described in “data.csv”. In addition to daily values for MVPA, TEE, AEE, LPA, MPA, VPA, and sedentary time, minutes of non-wear time is available Table 3. gives a description for variables included in the “data raw.csv” dataset.

### Table 1

| Participant characteristics. | Mean (SD) | Ranges |
|------------------------------|----------|--------|
| Height in cm                 | 173.5 (8.0) | 158–194 |
| Weight in kg                 | 76.0 (14.3) | 53.5–147.0 |
| Body mass index (kg/m²)      | 25.2 (4.0)  | 18.3–50.3 |
| Age in years (n=104)         | 40.6 (10.6) | 21–69   |

| Gender (n=105)  | Percentage | Ranges |
|----------------|------------|--------|
| Males          | 43.8 (46)  | Not applicable |
| Females        | 56.2 (59)  | Not applicable |

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Table 2
Variable description, data.csv.

| #  | Variable                  | Description                                                                 |
|----|---------------------------|-----------------------------------------------------------------------------|
| 1  | ID                        | Anonymized participant identified (1-113).                                   |
| 2  | Provider                  | Provider name (Garmin/Fitbit).                                              |
| 3  | 2019-01-Steps             | Average daily steps in January 2019.                                        |
| 4  | 2019-02-Steps             | Average daily steps in February 2019.                                       |
| 5  | 2019-03-Steps             | Average daily steps in March 2019.                                          |
| 6  | 2019-04-Steps             | Average daily steps in April 2019.                                          |
| 7  | 2019-05-Steps             | Average daily steps in May 2019.                                            |
| 8  | 2019-06-Steps             | Average daily steps in June 2019.                                           |
| 9  | 2019-07-Steps             | Average daily steps in July 2019.                                           |
| 10 | 2019-08-Steps             | Average daily steps in August 2019.                                         |
| 11 | 2019-09-Steps             | Average daily steps in September 2019.                                      |
| 12 | 2019-10-Steps             | Average daily steps in October 2019.                                        |
| 13 | 2019-11-Steps             | Average daily steps in November 2019.                                       |
| 14 | 2019-12-Steps             | Average daily steps in December 2019.                                       |
| 15 | 2020-01-Steps             | Average daily steps in January 2020.                                        |
| 16 | 2020-02-Steps             | Average daily steps in February 2020.                                       |
| 17 | 2020-03-Steps             | Average daily steps in March 2020.                                          |
| 18 | 2020-04-Steps             | Average daily steps in April 2020.                                          |
| 19 | 2020-05-Steps             | Average daily steps in May 2020.                                            |
| 20 | 2020-06-Steps             | Average daily steps in June 2020.                                           |
| 21 | 2020-07-Steps             | Average daily steps in July 2020.                                           |
| 22 | 2020-08-Steps             | Average daily steps in August 2020.                                         |
| 23 | 2020-09-Steps             | Average daily steps in September 2020.                                      |
| 24 | 2020-10-Steps             | Average daily steps in October 2020.                                        |
| 25 | 2020-11-Steps             | Average daily steps in November 2020.                                       |
| 26 | 2020-12-Steps             | Average daily steps in December 2020.                                       |
| 27 | 2020-03-01-Steps          | Average daily steps between March 1<sup>st</sup>-12<sup>th</sup>, 2020.    |
| 28 | 2020-03-13-Steps          | Average daily steps between March 13<sup>th</sup>-31<sup>st</sup>, 2020.  |
| 29 | 2019-Steps                | Average daily steps in 2019.                                                |
| 30 | 2020-Steps                | Average daily steps in 2020.                                                |
| 31 | 2019-01-Mvpa              | Average daily minutes of MVPA in January 2019.                              |
| 32 | 2019-02-Mvpa              | Average daily minutes of MVPA in February 2019.                             |
| 33 | 2019-03-Mvpa              | Average daily minutes of MVPA in March 2019.                                |
| 34 | 2019-04-Mvpa              | Average daily minutes of MVPA in April 2019.                                |
| 35 | 2019-05-Mvpa              | Average daily minutes of MVPA in May 2019.                                  |
| 36 | 2019-06-Mvpa              | Average daily minutes of MVPA in June 2019.                                 |
| 37 | 2019-07-Mvpa              | Average daily minutes of MVPA in July 2019.                                 |
| 38 | 2019-08-Mvpa              | Average daily minutes of MVPA in August 2019.                               |
| 39 | 2019-09-Mvpa              | Average daily minutes of MVPA in September 2019.                            |
| 40 | 2019-10-Mvpa              | Average daily minutes of MVPA in October 2019.                              |
| 41 | 2019-11-Mvpa              | Average daily minutes of MVPA in November 2019.                             |
| 42 | 2019-12-Mvpa              | Average daily minutes of MVPA in December 2019.                             |
| 43 | 2020-01-Mvpa              | Average daily minutes of MVPA in January 2020.                              |
| 44 | 2020-02-Mvpa              | Average daily minutes of MVPA in February 2020.                             |
| 45 | 2020-03-Mvpa              | Average daily minutes of MVPA in March 2020.                                |
| 46 | 2020-04-Mvpa              | Average daily minutes of MVPA in April 2020.                                |
| 47 | 2020-05-Mvpa              | Average daily minutes of MVPA in May 2020.                                  |
| 48 | 2020-06-Mvpa              | Average daily minutes of MVPA in June 2020.                                 |
| 49 | 2020-07-Mvpa              | Average daily minutes of MVPA in July 2020.                                 |
| 50 | 2020-08-Mvpa              | Average daily minutes of MVPA in August 2020.                               |
| 51 | 2020-09-Mvpa              | Average daily minutes of MVPA in September 2020.                            |
| 52 | 2020-10-Mvpa              | Average daily minutes of MVPA in October 2020.                              |
| 53 | 2020-11-Mvpa              | Average daily minutes of MVPA in November 2020.                             |
| 54 | 2020-12-Mvpa              | Average daily minutes of MVPA in December 2020.                             |
| 55 | 2020-03-01-Mvpa           | Average daily minutes of MVPA between March 1<sup>st</sup>-12<sup>th</sup>, 2020. |
| 56 | 2020-03-13-Mvpa           | Average daily minutes of MVPA between March 13<sup>th</sup>-31<sup>st</sup>, 2020. |
| 57 | 2019-Mvpa                 | Average daily minutes of MVPA in 2019.                                      |
| 58 | 2020-Mvpa                 | Average daily minutes of MVPA in 2020.                                      |
| 59 | 2019-01-TEE               | Average daily TEE (kcal) in January 2019.                                   |
| 60 | 2019-02-TEE               | Average daily TEE (kcal) in February 2019.                                  |

(continued on next page)
Table 2 (continued)

| #   | Variable          | Description                                                                 |
|-----|-------------------|-----------------------------------------------------------------------------|
| 61  | 2019-03-TEE       | Average daily TEE (kcal) in March 2019.                                     |
| 62  | 2019-04-TEE       | Average daily TEE (kcal) in April 2019.                                     |
| 63  | 2019-05-TEE       | Average daily TEE (kcal) in May 2019.                                       |
| 64  | 2019-06-TEE       | Average daily TEE (kcal) in June 2019.                                      |
| 65  | 2019-07-TEE       | Average daily TEE (kcal) in July 2019.                                      |
| 66  | 2019-08-TEE       | Average daily TEE (kcal) in August 2019.                                    |
| 67  | 2019-09-TEE       | Average daily TEE (kcal) in September 2019.                                 |
| 68  | 2019-10-TEE       | Average daily TEE (kcal) in October 2019.                                   |
| 69  | 2019-11-TEE       | Average daily TEE (kcal) in November 2019.                                  |
| 70  | 2019-12-TEE       | Average daily TEE (kcal) in December 2019.                                  |
| 71  | 2020-01-TEE       | Average daily TEE (kcal) in January 2020.                                   |
| 72  | 2020-02-TEE       | Average daily TEE (kcal) in February 2020.                                  |
| 73  | 2020-03-TEE       | Average daily TEE (kcal) in March 2020.                                     |
| 74  | 2020-04-TEE       | Average daily TEE (kcal) in April 2020.                                     |
| 75  | 2020-05-TEE       | Average daily TEE (kcal) in May 2020.                                       |
| 76  | 2020-06-TEE       | Average daily TEE (kcal) in June 2020.                                      |
| 77  | 2020-07-TEE       | Average daily TEE (kcal) in July 2020.                                      |
| 78  | 2020-08-TEE       | Average daily TEE (kcal) in August 2020.                                    |
| 79  | 2020-09-TEE       | Average daily TEE (kcal) in September 2020.                                 |
| 80  | 2020-10-TEE       | Average daily TEE (kcal) in October 2020.                                   |
| 81  | 2020-11-TEE       | Average daily TEE (kcal) in November 2020.                                  |
| 82  | 2020-12-TEE       | Average daily TEE (kcal) in December 2020.                                  |
| 83  | 2020-03-01-TEE    | Average daily TEE (kcal) between March 1<sup>st</sup>-12<sup>th</sup>, 2020. |
| 84  | 2020-03-13-TEE    | Average daily TEE (kcal) between March 13<sup>th</sup>-31<sup>st</sup>, 2020.|
| 85  | 2019-TEE          | Average daily TEE (kcal) in 2019.                                           |
| 86  | 2020-TEE          | Average daily TEE (kcal) in 2020.                                           |
| 87  | 2019-01-AEE       | Average daily AEE (kcal) in January 2019.                                   |
| 88  | 2019-02-AEE       | Average daily AEE (kcal) in February 2019.                                  |
| 89  | 2019-03-AEE       | Average daily AEE (kcal) in March 2019.                                     |
| 90  | 2019-04-AEE       | Average daily AEE (kcal) in April 2019.                                     |
| 91  | 2019-05-AEE       | Average daily AEE (kcal) in May 2019.                                       |
| 92  | 2019-06-AEE       | Average daily AEE (kcal) in June 2019.                                      |
| 93  | 2019-07-AEE       | Average daily AEE (kcal) in July 2019.                                      |
| 94  | 2019-08-AEE       | Average daily AEE (kcal) in August 2019.                                    |
| 95  | 2019-09-AEE       | Average daily AEE (kcal) in September 2019.                                 |
| 96  | 2019-10-AEE       | Average daily AEE (kcal) in October 2019.                                   |
| 97  | 2019-11-AEE       | Average daily AEE (kcal) in November 2019.                                  |
| 98  | 2019-12-AEE       | Average daily AEE (kcal) in December 2019.                                  |
| 99  | 2020-01-AEE       | Average daily AEE (kcal) in January 2020.                                   |
| 100 | 2020-02-AEE       | Average daily AEE (kcal) in February 2020.                                  |
| 101 | 2020-03-AEE       | Average daily AEE (kcal) in March 2020.                                     |
| 102 | 2020-04-AEE       | Average daily AEE (kcal) in April 2020.                                     |
| 103 | 2020-05-AEE       | Average daily AEE (kcal) in May 2020.                                       |
| 104 | 2020-06-AEE       | Average daily AEE (kcal) in June 2020.                                      |
| 105 | 2020-07-AEE       | Average daily AEE (kcal) in July 2020.                                      |
| 106 | 2020-08-AEE       | Average daily AEE (kcal) in August 2020.                                    |
| 107 | 2020-09-AEE       | Average daily AEE (kcal) in September 2020.                                 |
| 108 | 2020-10-AEE       | Average daily AEE (kcal) in October 2020.                                   |
| 109 | 2020-11-AEE       | Average daily AEE (kcal) in November 2020.                                  |
| 110 | 2020-12-AEE       | Average daily AEE (kcal) in December 2020.                                  |
| 111 | 2020-03-01-AEE    | Average daily AEE (kcal) between March 1<sup>st</sup>-12<sup>th</sup>, 2020.|
| 112 | 2020-03-13-AEE    | Average daily AEE (kcal) between March 13<sup>th</sup>-31<sup>st</sup>, 2020.|
| 113 | 2019-AEE          | Average daily AEE (kcal) in 2019.                                           |
| 114 | 2020-AEE          | Average daily AEE (kcal) in 2020.                                           |
| 115 | 2019-01-LPA       | Average daily minutes of LPA in January 2019.                               |
| 116 | 2019-02-LPA       | Average daily minutes of LPA in February 2019.                              |
| 117 | 2019-03-LPA       | Average daily minutes of LPA in March 2019.                                 |
| 118 | 2019-04-LPA       | Average daily minutes of LPA in April 2019.                                 |
| 119 | 2019-05-LPA       | Average daily minutes of LPA in May 2019.                                   |
| 120 | 2019-06-LPA       | Average daily minutes of LPA in June 2019.                                  |

(continued on next page)
Table 2 (continued)

| #   | Variable          | Description                                                                 |
|-----|-------------------|-----------------------------------------------------------------------------|
| 121 | 2019-07-LPA       | Average daily minutes of LPA in July 2019.                                  |
| 122 | 2019-08-LPA       | Average daily minutes of LPA in August 2019.                                |
| 123 | 2019-09-LPA       | Average daily minutes of LPA in September 2019.                             |
| 124 | 2019-10-LPA       | Average daily minutes of LPA in October 2019.                               |
| 125 | 2019-11-LPA       | Average daily minutes of LPA in November 2019.                              |
| 126 | 2019-12-LPA       | Average daily minutes of LPA in December 2019.                              |
| 127 | 2020-01-LPA       | Average daily minutes of LPA in January 2020.                               |
| 128 | 2020-02-LPA       | Average daily minutes of LPA in February 2020.                              |
| 129 | 2020-03-LPA       | Average daily minutes of LPA in March 2020.                                 |
| 130 | 2020-04-LPA       | Average daily minutes of LPA in April 2020.                                 |
| 131 | 2020-05-LPA       | Average daily minutes of LPA in May 2020.                                   |
| 132 | 2020-06-LPA       | Average daily minutes of LPA in June 2020.                                  |
| 133 | 2020-07-LPA       | Average daily minutes of LPA in July 2020.                                  |
| 134 | 2020-08-LPA       | Average daily minutes of LPA in August 2020.                                |
| 135 | 2020-09-LPA       | Average daily minutes of LPA in September 2020.                             |
| 136 | 2020-10-LPA       | Average daily minutes of LPA in October 2020.                               |
| 137 | 2020-11-LPA       | Average daily minutes of LPA in November 2020.                              |
| 138 | 2020-12-LPA       | Average daily minutes of LPA in December 2020.                              |
| 139 | 2020-03-01-LPA    | Average daily minutes of LPA between March 1st–12th, 2020.                  |
| 140 | 2020-03-13-LPA    | Average daily minutes of LPA between March 13th–31st, 2020.                 |
| 141 | 2019-LPA          | Average daily minutes of LPA in 2019.                                       |
| 142 | 2020-LPA          | Average daily minutes of LPA in 2020.                                       |
| 143 | 2019-01-MPA       | Average daily minutes of MPA in January 2019.                               |
| 144 | 2019-02-MPA       | Average daily minutes of MPA in February 2019.                              |
| 145 | 2019-03-MPA       | Average daily minutes of MPA in March 2019.                                 |
| 146 | 2019-04-MPA       | Average daily minutes of MPA in April 2019.                                 |
| 147 | 2019-05-MPA       | Average daily minutes of MPA in May 2019.                                   |
| 148 | 2019-06-MPA       | Average daily minutes of MPA in June 2019.                                  |
| 149 | 2019-07-MPA       | Average daily minutes of MPA in July 2019.                                  |
| 150 | 2019-08-MPA       | Average daily minutes of MPA in August 2019.                                |
| 151 | 2019-09-MPA       | Average daily minutes of MPA in September 2019.                             |
| 152 | 2019-10-MPA       | Average daily minutes of MPA in October 2019.                               |
| 153 | 2019-11-MPA       | Average daily minutes of MPA in November 2019.                              |
| 154 | 2019-12-MPA       | Average daily minutes of MPA in December 2019.                              |
| 155 | 2020-01-MPA       | Average daily minutes of MPA in January 2020.                               |
| 156 | 2020-02-MPA       | Average daily minutes of MPA in February 2020.                              |
| 157 | 2020-03-MPA       | Average daily minutes of MPA in March 2020.                                 |
| 158 | 2020-04-MPA       | Average daily minutes of MPA in April 2020.                                 |
| 159 | 2020-05-MPA       | Average daily minutes of MPA in May 2020.                                   |
| 160 | 2020-06-MPA       | Average daily minutes of MPA in June 2020.                                  |
| 161 | 2020-07-MPA       | Average daily minutes of MPA in July 2020.                                  |
| 162 | 2020-08-MPA       | Average daily minutes of MPA in August 2020.                                |
| 163 | 2020-09-MPA       | Average daily minutes of MPA in September 2020.                             |
| 164 | 2020-10-MPA       | Average daily minutes of MPA in October 2020.                               |
| 165 | 2020-11-MPA       | Average daily minutes of MPA in November 2020.                              |
| 166 | 2020-12-MPA       | Average daily minutes of MPA in December 2020.                              |
| 167 | 2020-03-01-MPA    | Average daily minutes of MPA between March 1st–12th, 2020.                  |
| 168 | 2020-03-13-MPA    | Average daily minutes of MPA between March 13th–31st, 2020.                 |
| 169 | 2019-MPA          | Average daily minutes of MPA in 2019.                                       |
| 170 | 2020-MPA          | Average daily minutes of MPA in 2020.                                       |
| 171 | 2019-01-VPA       | Average daily minutes of VPA in January 2019.                               |
| 172 | 2019-02-VPA       | Average daily minutes of VPA in February 2019.                               |
| 173 | 2019-03-VPA       | Average daily minutes of VPA in March 2019.                                 |
| 174 | 2019-04-VPA       | Average daily minutes of VPA in April 2019.                                 |
| 175 | 2019-05-VPA       | Average daily minutes of VPA in May 2019.                                   |
| 176 | 2019-06-VPA       | Average daily minutes of VPA in June 2019.                                  |
| 177 | 2019-07-VPA       | Average daily minutes of VPA in July 2019.                                  |
| 178 | 2019-08-VPA       | Average daily minutes of VPA in August 2019.                                |
| 179 | 2019-09-VPA       | Average daily minutes of VPA in September 2019.                             |
| 180 | 2019-10-VPA       | Average daily minutes of VPA in October 2019.                               |

(continued on next page)
Table 2 (continued)

| #    | Variable          | Description                                      |
|------|-------------------|--------------------------------------------------|
| 181  | 2019-11-VPA       | Average daily minutes of VPA in November 2019.   |
| 182  | 2019-12-VPA       | Average daily minutes of VPA in December 2019.   |
| 183  | 2020-01-VPA       | Average daily minutes of VPA in January 2020.    |
| 184  | 2020-02-VPA       | Average daily minutes of VPA in February 2020.   |
| 185  | 2020-03-VPA       | Average daily minutes of VPA in March 2020.      |
| 186  | 2020-04-VPA       | Average daily minutes of VPA in April 2020.      |
| 187  | 2020-05-VPA       | Average daily minutes of VPA in May 2020.        |
| 188  | 2020-06-VPA       | Average daily minutes of VPA in June 2020.       |
| 189  | 2020-07-VPA       | Average daily minutes of VPA in July 2020.       |
| 190  | 2020-08-VPA       | Average daily minutes of VPA in August 2020.     |
| 191  | 2020-09-VPA       | Average daily minutes of VPA in September 2020.  |
| 192  | 2020-10-VPA       | Average daily minutes of VPA in October 2020.    |
| 193  | 2020-11-VPA       | Average daily minutes of VPA in November 2020.   |
| 194  | 2020-12-VPA       | Average daily minutes of VPA in December 2020.   |
| 195  | 2020-03-01-VPA    | Average daily minutes of VPA between March 1st–12th, 2020. |
| 196  | 2020-03-13-VPA    | Average daily minutes of VPA between March 13th–31st, 2020. |
| 197  | 2019-VPA          | Average daily minutes of VPA in 2019.            |
| 198  | 2020-VPA          | Average daily minutes of VPA in 2020.            |
| 199  | 2019-01-SED       | Average daily minutes of sedentary time in January 2019. |
| 200  | 2019-02-SED       | Average daily minutes of sedentary time in February 2019. |
| 201  | 2019-03-SED       | Average daily minutes of sedentary time in March 2019. |
| 202  | 2019-04-SED       | Average daily minutes of sedentary time in April 2019. |
| 203  | 2019-05-SED       | Average daily minutes of sedentary time in May 2019. |
| 204  | 2019-06-SED       | Average daily minutes of sedentary time in June 2019. |
| 205  | 2019-07-SED       | Average daily minutes of sedentary time in July 2019. |
| 206  | 2019-08-SED       | Average daily minutes of sedentary time in August 2019. |
| 207  | 2019-09-SED       | Average daily minutes of sedentary time in September 2019. |
| 208  | 2019-10-SED       | Average daily minutes of sedentary time in October 2019. |
| 209  | 2019-11-SED       | Average daily minutes of sedentary time in November 2019. |
| 210  | 2019-12-SED       | Average daily minutes of sedentary time in December 2019. |
| 211  | 2020-01-SED       | Average daily minutes of sedentary time in January 2020. |
| 212  | 2020-02-SED       | Average daily minutes of sedentary time in February 2020. |
| 213  | 2020-03-SED       | Average daily minutes of sedentary time in March 2020. |
| 214  | 2020-04-SED       | Average daily minutes of sedentary time in April 2020. |
| 215  | 2020-05-SED       | Average daily minutes of sedentary time in May 2020. |
| 216  | 2020-06-SED       | Average daily minutes of sedentary time in June 2020. |
| 217  | 2020-07-SED       | Average daily minutes of sedentary time in July 2020. |
| 218  | 2020-08-SED       | Average daily minutes of sedentary time in August 2020. |
| 219  | 2020-09-SED       | Average daily minutes of sedentary time in September 2020. |
| 220  | 2020-10-SED       | Average daily minutes of sedentary time in October 2020. |
| 221  | 2020-11-SED       | Average daily minutes of sedentary time in November 2020. |
| 222  | 2020-12-SED       | Average daily minutes of sedentary time in December 2020. |
| 223  | 2020-03-01-SED    | Average daily minutes of sedentary time between March 1st–12th, 2020. |
| 224  | 2020-03-13-SED    | Average daily minutes of sedentary time between March 13th–31st, 2020. |
| 225  | 2019-SED          | Average daily minutes of sedentary time in 2019.  |
| 226  | 2020-SED          | Average daily minutes of sedentary time in 2020.  |

2. Experimental Design, Materials and Methods

Participants who owned an activity tracker (or smart watch) from Fitbit, Garmin, or Oura (activity ring), and who agreed to share physical activity related data collected from these devices between January 2019 and December 2020, were eligible for inclusion. No participants owned an Oura.

Participants were recruited by publishing on UiT The Arctic University of Norway’s web pages [3]. The story was picked up and published in national online news outlets [4,5] and in some closed internet forums. Recruitment was performed between October 2020 and December 2020.

Participants were asked to share data by authorizing data sharing from their activity tracker provider. Authorization and automatic data download were performed using mSpider, a tool
which allow study participants to share daily activity tracker data automatically and continuously. The mSpider system is described elsewhere [1]. The mSpider tool also support data extraction from other providers, including Polar, Samsung, and Apple, but these providers could not be included in the study. Polar only allow prospective data extraction, and we could not extract activity data collected before participant signup date. Apple and Samsung require a custom application to be installed on the participant smartphone. These were not finalized before recruitment and could not be used.

The Norwegian COVID-19 lockdown was initiated March 12th, 2020, closing gyms, schools, universities, kindergartens, and similar institutions. People were asked to avoid groups as much as possible, but outdoor exercise was allowed. Social restrictions were gradually lifted in April and May, but gradually reintroduced from August 2020.

For each participant, historic data were downloaded from January 2019 up to the inclusion date. Prospective data were download daily, up to and including December 2020. Authorization information was removed in January 2021, and data access to provider systems were no longer available.

For several participants, PA data were partly unavailable for the full two-year period. This was due to two reasons; (1) the participant did not own the device in the beginning of the period, and (2) the participant did not wear the device for a period of time. For the former, no PA values were registered. The latter were indicated with a zero value for all PA outcomes. The “data raw.csv” file (i.e., daily values) includes all days of 2019 and 2020 for each participant where data were available from the provider, also for the days where the participant did not wear the device.

In the “data.csv” file (i.e., averages), valid days were used to calculate monthly and yearly averages for each participant. The value ‘NULL’ indicates that no valid days existed in the specified period for the given data type. Valid days were defined as days with at least 10 h of wear time [6], or more than 150 steps. A step threshold was set because wear time was not available for Garmin devices. Since Fitbit provides both daily steps and hours of wear time, the 150-threshold were selected by identifying the lowest step count among Fitbit-participants where wear time was more than 10 h.

### Ethics Statements

Participants had to actively enrol in the data collection by authorizing access to their activity tracker provider's online data storage. Participants were informed that authorizing access constituted informed consent. The authors have the right to redistribute the data.

The study was reviewed by The Regional Committees for Medical and Health Research Ethics North (reference 164780). The data collection was reviewed by Norwegian Centre for Research Data (reference 628485).
Data Availability

Replication Data for: Dataset of Consumer-Based Activity Trackers as a Tool for Physical Activity Monitoring in Epidemiological Studies During the COVID-19 Pandemic (Original data) (Dataverse).

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT Author Statement

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