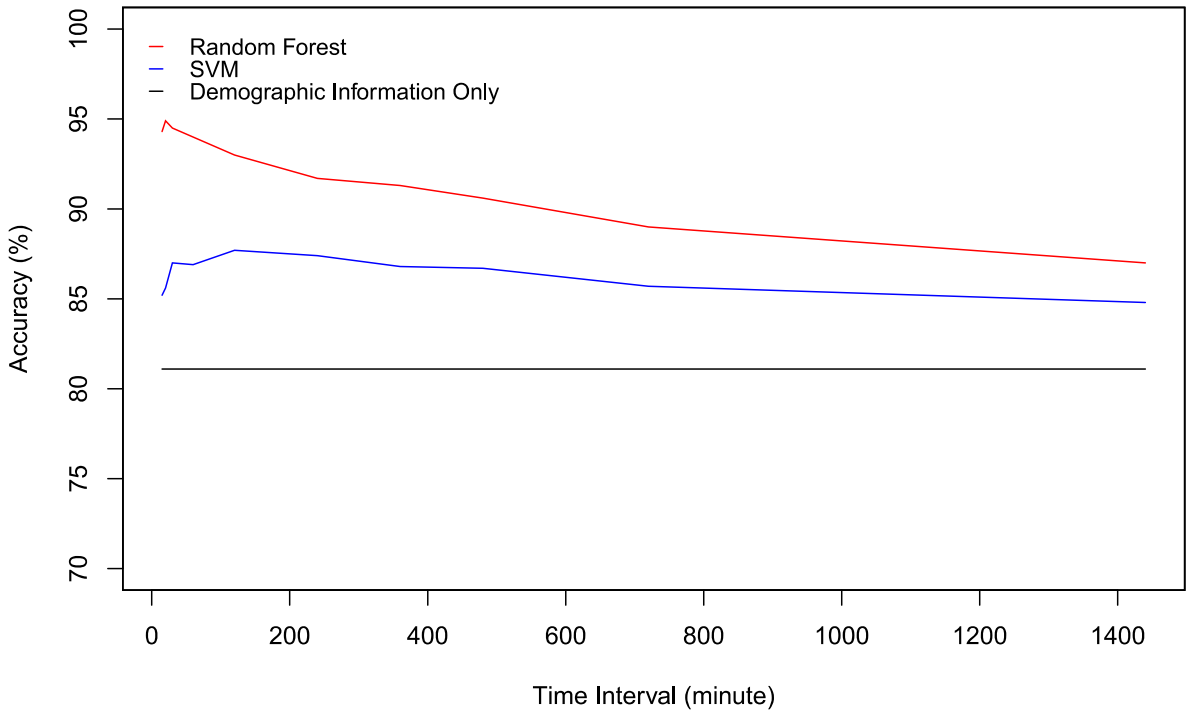
Supplementary Online Content

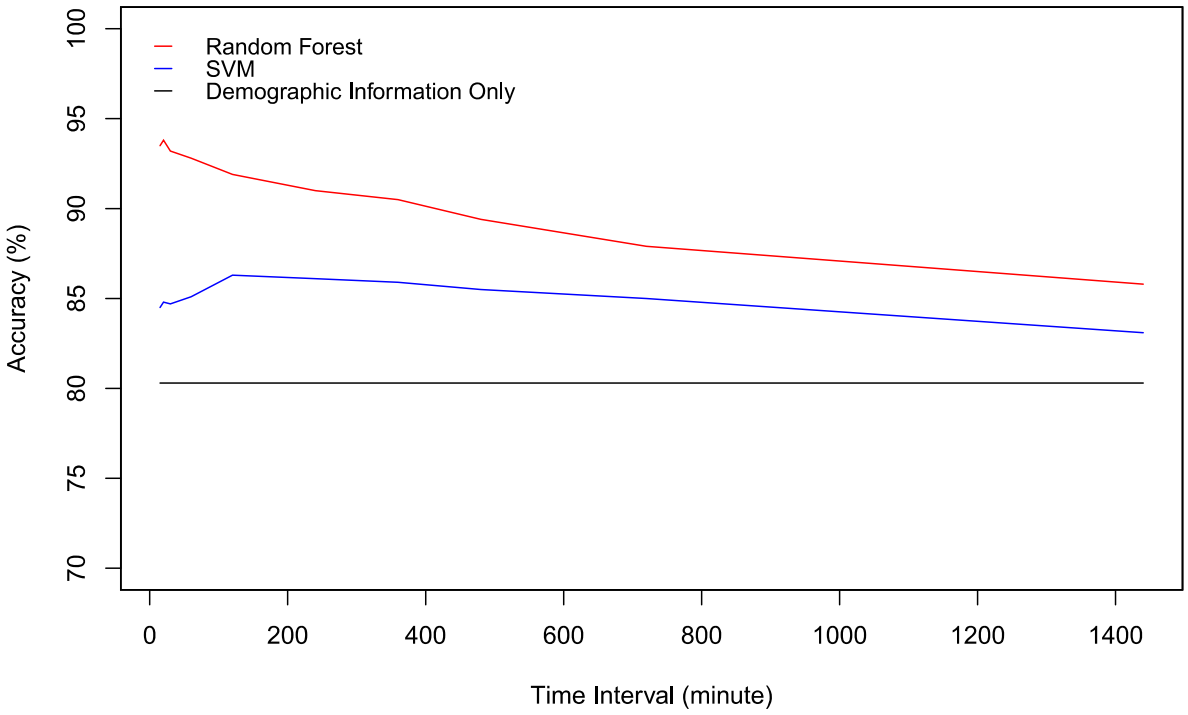
Na L, Yang C, Lo C-C, Zhao F, Fukuoka Y, Aswani A. Feasibility of reidentifying individuals in large national physical activity data sets from which protected health information has been removed with use of machine learning. *JAMA Netw Open.* 2018;1(8):e186040. doi:10.1001/jamanetworkopen.2018.6040

This supplementary material has been provided by the authors to give readers additional information about their work.

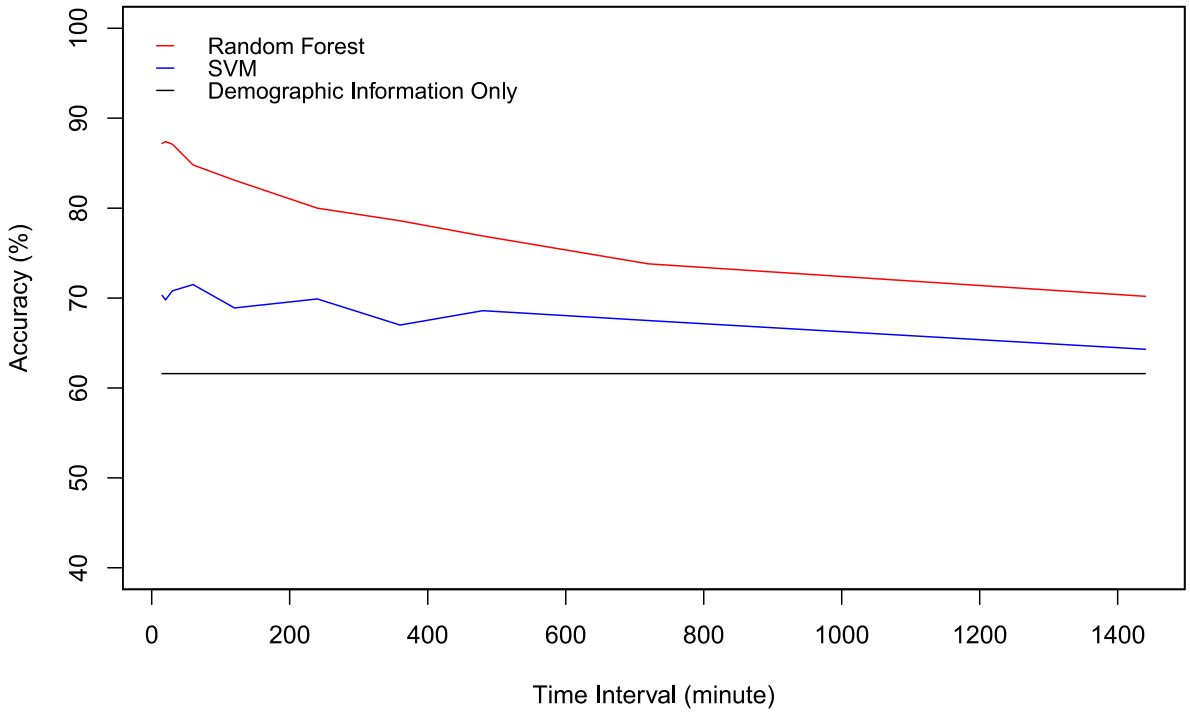
eFigure 1. Percentage of Correctly Reidentified Matches at Different Time Resolutions of Partial Aggregation of Physical Activity Data for Adults in NHANES 2003-2004



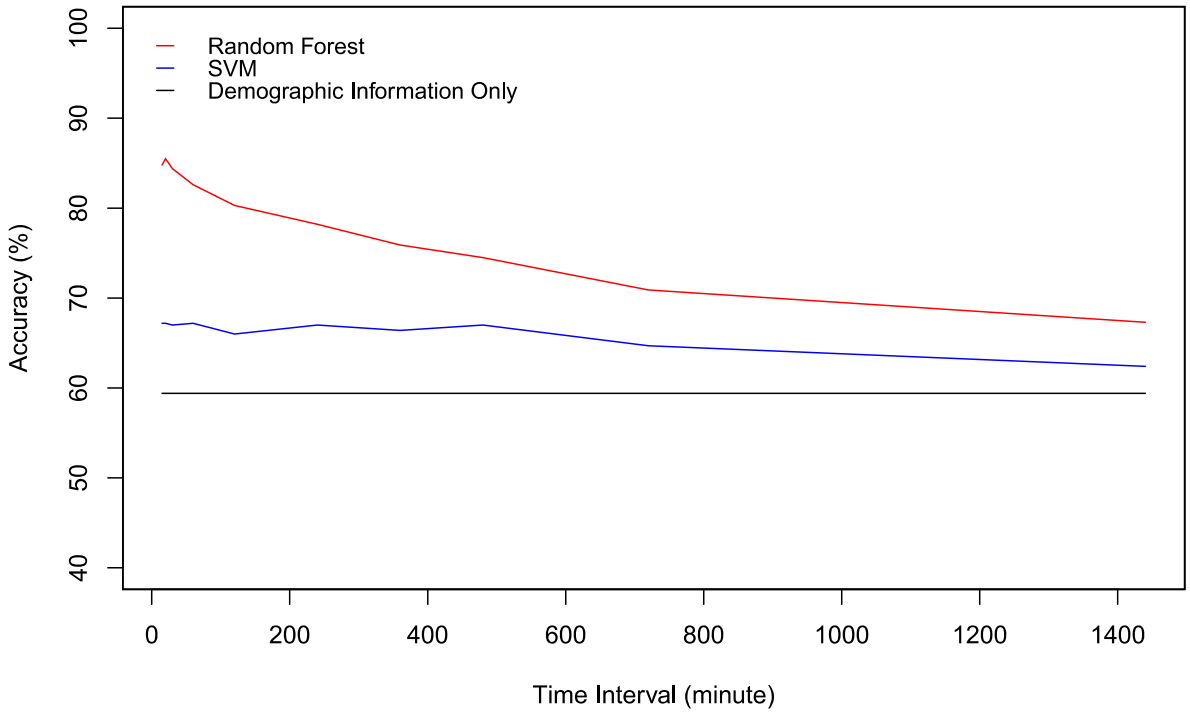
eFigure 2. Percentage of Correctly Reidentified Matches at Different Time Resolutions of Partial Aggregation of Physical Activity Data for Adults in NHANES 2005-2006



eFigure 3. Percentage of Correctly Reidentified Matches at Different Time Resolutions of Partial Aggregation of Physical Activity Data for Children in NHANES 2003-2004



eFigure 4. Percentage of Correctly Reidentified Matches at Different Time Resolutions of Partial Aggregation of Physical Activity Data for Children in NHANES 2005-2006



eTable 1. Number of Correctly Reidentified Matches in Testing Data, with Physical Activity Data Partially Aggregated into 20 Minute Intervals, When Different Days of the Week Are Used for the Training and Testing Data

Sample/ Year	Machine Learning Algorithm	Days Used for Testing Data				
		Mon, Thu	Tue, Thu	Tue, Fri	Wed, Thu	Wed, Fri
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Adults in NHANES 2003-2004	Linear SVM	4036 (85.5)[a]	4049 (85.8)[a]	4063 (86.1)[a]	4033 (85.4)[a]	4034 (85.4)[a]
	Random Forest	4383 (92.8)[a]	4413 (93.5)[a]	4405 (93.3)[a]	4400 (93.2)[a]	4402 (93.2)[a]
Adults in NHANES 2005-2006	Linear SVM	4018 (84.3)[a]	4024 (84.4)[a]	4030 (84.6)[a]	4055 (85.1)[a]	4050 (85.0)[a]
	Random Forest	4370 (91.7)[a]	4403 (92.4)[a]	4409 (92.5)[a]	4392 (92.1)[a]	4384 (92.0)[a]
Children in NHANES 2003-2004	Linear SVM	1664 (68.6)[a]	1715 (70.7)[a]	1704 (70.2)[a]	1680 (69.2)[a]	1685 (69.4)[a]
	Random Forest	2019 (83.2)[a]	2099 (86.5)[a]	2068 (85.2)[a]	2084 (85.9)[a]	2065 (85.1)[a]
Children in NHANES 2005-2006	Linear SVM	1699 (66.9)[a]	1708 (67.2)[a]	1721 (67.8)[a]	1692 (66.6)[a]	1727 (68.0)[a]
	Random Forest	2089 (82.3)[a]	2145 (84.5)[a]	2114 (83.3)[a]	2111 (83.1)[a]	2120 (83.5)[a]

Abbreviations: NHANES, National Health and Nutrition Examination Survey; SVM = Support Vector Machine
[a] $P < 0.001$

eTable 2. Number of Correctly Reidentified Matches in Testing Data, with Physical Activity Data Partially Aggregated into 20 Minute Intervals, When the Only Demographic Data Used is Age and Gender

NHANES 2003-2004				
Machine Learning Algorithm	**Adults: Age and Gender Only**	**Adults: Age and Gender with Physical Intensity**	**Children: Age and Gender Only**	**Children: Age and Gender with Physical Intensity**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**
Linear SVM	136 (2.9)[a]	152 (3.2)[a]	24 (1.0)[a]	21 (0.9)[a]
Random Forest		1511 (32.0)[a]		619 (25.5)[a]
NHANES 2005-2006				
Machine Learning Algorithm	**Adults: Age and Gender Only**	**Adults: Age and Gender with Physical Intensity**	**Children: Age and Gender Only**	**Children: Age and Gender with Physical Intensity**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**
Linear SVM	136 (2.9)[a]	168 (3.5)[a]	24 (0.9)[a]	26 (1.0)[a]
Random Forest		1597 (33.5)[a]		669 (26.3)[a]

Abbreviations: NHANES, National Health and Nutrition Examination Survey;SVM = Support Vector Machine
[a] $P < 0.001$

eTable 3. Number of Correctly Reidentified Matches in Testing Data, with Physical Activity Data Partially Aggregated into 20 Minute Intervals, When There is an Artificial Non-Overlap in the Record Numbers in the Testing and Training Data

NHANES 2003-2004				
Machine Learning Algorithm	**Adults: Demographics Only**	**Adults: Demographics with Physical Intensity**	**Children: Demographics Only**	**Children: Demographics with Physical Intensity**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**
Linear SVM	2404 (63.6)[a]	3310 (87.6)[a]	978 (50.4)[a]	1413 (72.8)[a]
Random Forest		3420 (90.5)[a]		1532 (78.9)[a]
NHANES 2005-2006				
Machine Learning Algorithm	**Adults: Demographics Only**	**Adults: Demographics with Physical Intensity**	**Children: Demographics Only**	**Children: Demographics with Physical Intensity**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**
Linear SVM	2398 (62.8)[a]	3272 (85.8)[a]	977 (48.1)[a]	1439 (70.8)[a]
Random Forest		3428 (89.9)[a]		1538 (75.7)[a]

Abbreviations: NHANES, National Health and Nutrition Examination Survey; SVM = Support Vector Machine
[a] $P < 0.001$