Family Life, Activity, Sun, Health, and Eating (FLASHE) Study:

Updated Data Resources

November 5, 2018

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Webinar Presenters

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1. *FLASHE Goals and Overview*

2. *GeoFLASHE Public Use Data*

3. *FLASHE Imputed Survey Data*

4. *FLASHE Adolescent Accelerometer Data*

5. *Q&A*

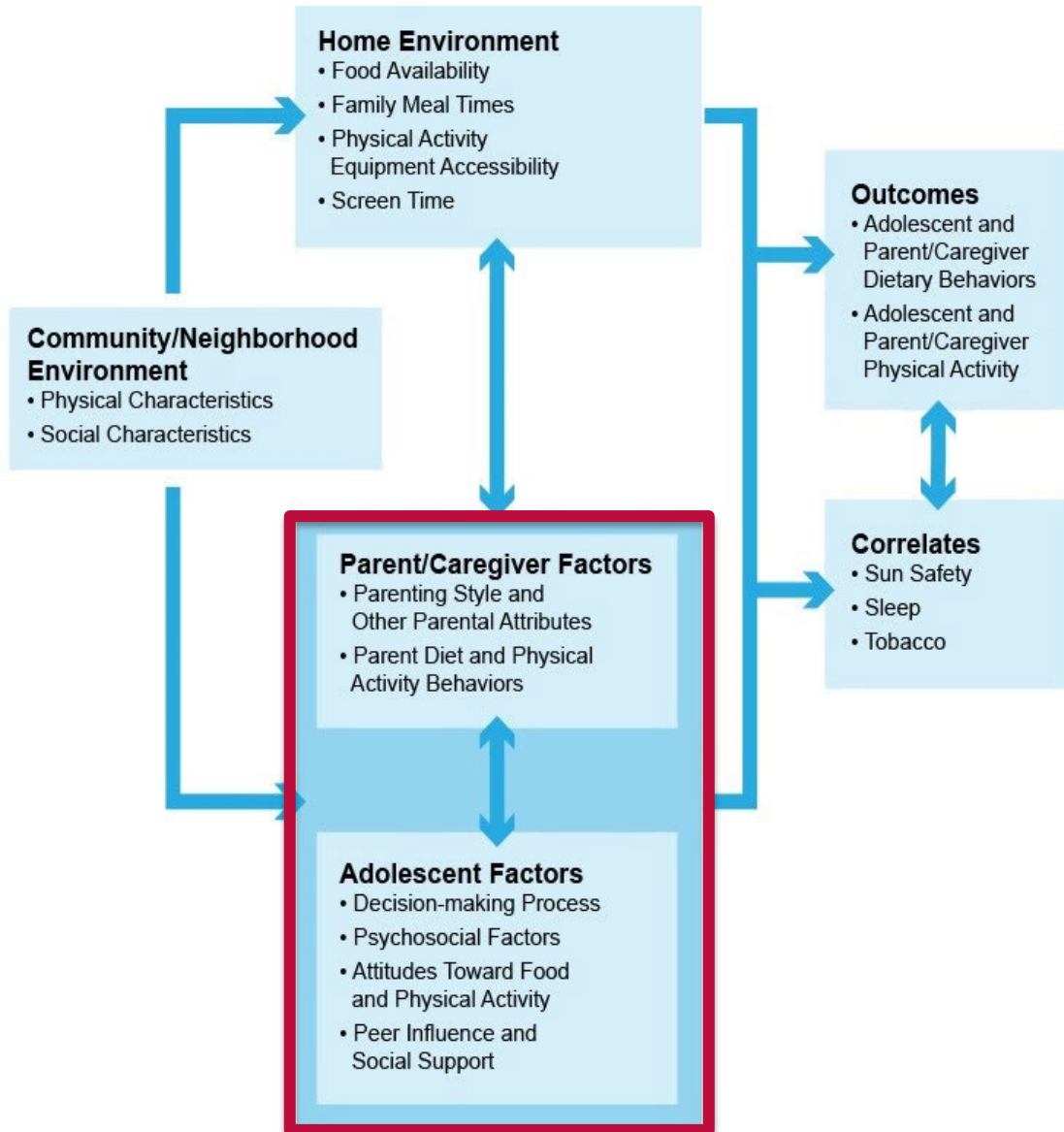NATIONAL CANCER INSTITUTE

Introduction

April Oh, Ph.D., M.P.H.

Program Director
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What is FLASHE?

- A cross-sectional study in 2014 to assess correlates of cancer-preventive behaviors among parent-adolescent dyads

- Parents and adolescents each completed:

  - Diet-focused survey

  - Physical activity-focused survey (also including sun safety, sleep, and tobacco use items)

  - Module assessing parenting style and demographics

- Some dyads also completed an adolescent accelerometer protocol.

- Home and school neighborhood locations were geocoded in a geoFLASHE dataset released in 2018.

FLASHE Conceptual Model

Home Environment
- Food Availability
- Family Meal Times
- Physical Activity Equipment Accessibility
- Screen Time

Community/Neighborhood Environment
- Physical Characteristics
- Social Characteristics

Outcomes
- Adolescent and Parent/Caregiver Dietary Behaviors
- Adolescent and Parent/Caregiver Physical Activity

Parent/Caregiver Factors
- Parenting Style and Other Parental Attributes
- Parent Diet and Physical Activity Behaviors

Correlates
- Sun Safety
- Sleep
- Tobacco

Adolescent Factors
- Decision-making Process
- Psychosocial Factors
- Attitudes Toward Food and Physical Activity
- Peer Influence and Social Support

- The parent/adolescent dyadic relationship is a core feature of this framework and survey, which collected data from both dyad members.

FLASHE Study Design

Starting Sample Invited to Participate in FLASHE
N=5,027 dyads

Enrollment in FLASHE
N=1,945 dyads

38.7% Enrollment Completion Rate

Survey-Only Group: Web Surveys Only
N=1,072 dyads

85.6% Survey Completion Rate

Motion Study Group: Web Surveys + Acclerometer
N=407 dyads

58.7% Motion Study Completion Rate

Analytic Database
N=1,479 dyads

29.4% Overall Response Rate
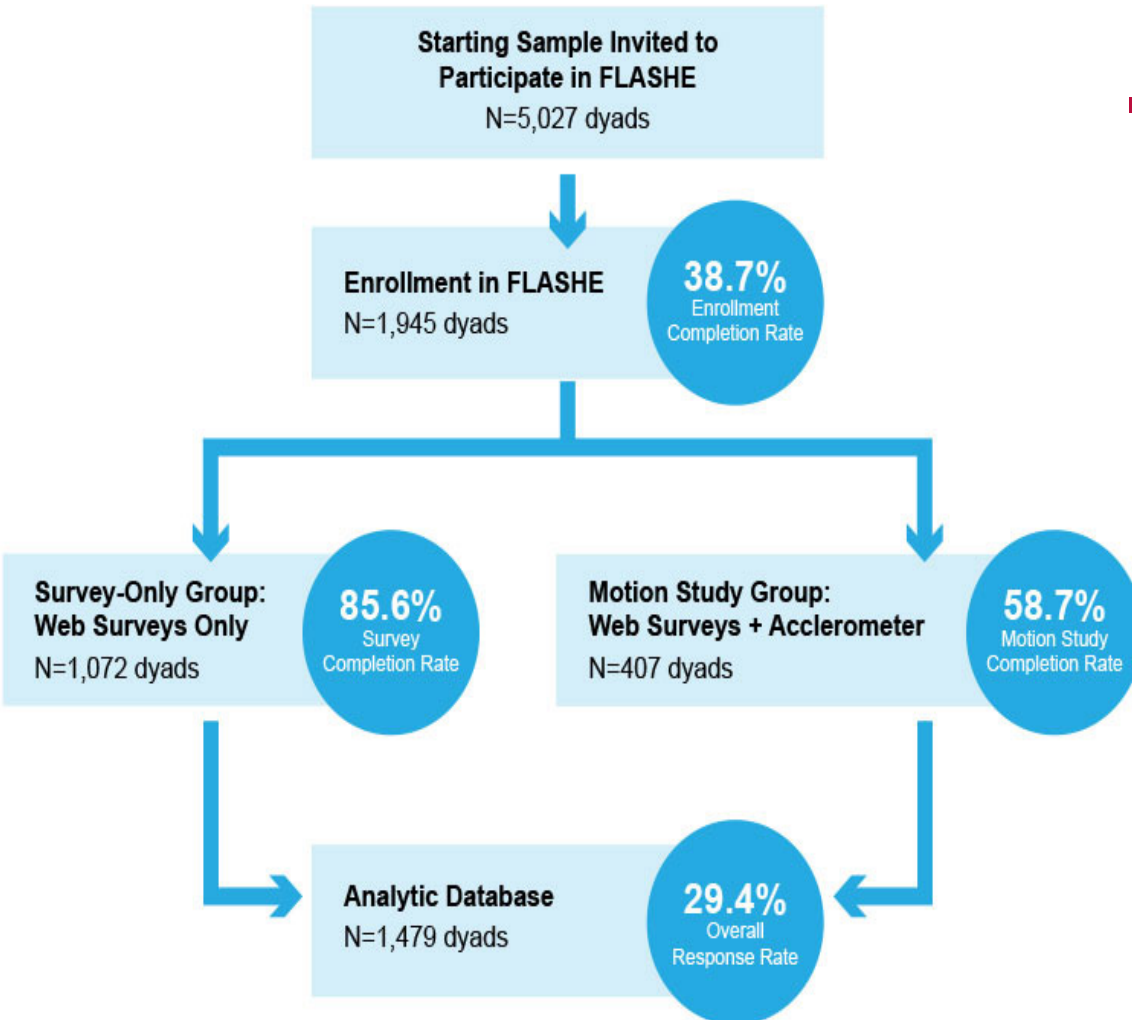
- Core features:
  - Dyadic design
  - Random assignment to the survey-only group or motion study group
  - The analytic database includes individual-level data sets that can be merged by dyad and participant identifiers.

This figure shows dyad-level completion rates; sample sizes vary depending on specific analyses.

FLASHE Data User Resources at
https://cancercontrol.cancer.gov/flashe

Data Resource	Description
Data sets	Diet, physical activity, and demographic survey data sets New GeoFLASHE dataset
Annotated surveys and codebook	Documentation of survey items and corresponding variable names/labels Separate codebook for GeoFLASHE variables
Construct tables	Includes sources/references for survey items
Methodology reports	Summarizes the study recruitment and methods
Data users' guide	Describes computation and recoding of variables and statistical weights Separate data users' guide for GeoFLASHE
Linked dyadic analysis resource page	FLASHE dyadic analysis user's guide and code
Linked FLASHE theme issue information	June 2017 issue of American Journal of Preventive Medicine

FLASHE Data Access and Resources

■ Earlier webinars provide more detail on some areas of FLASHE

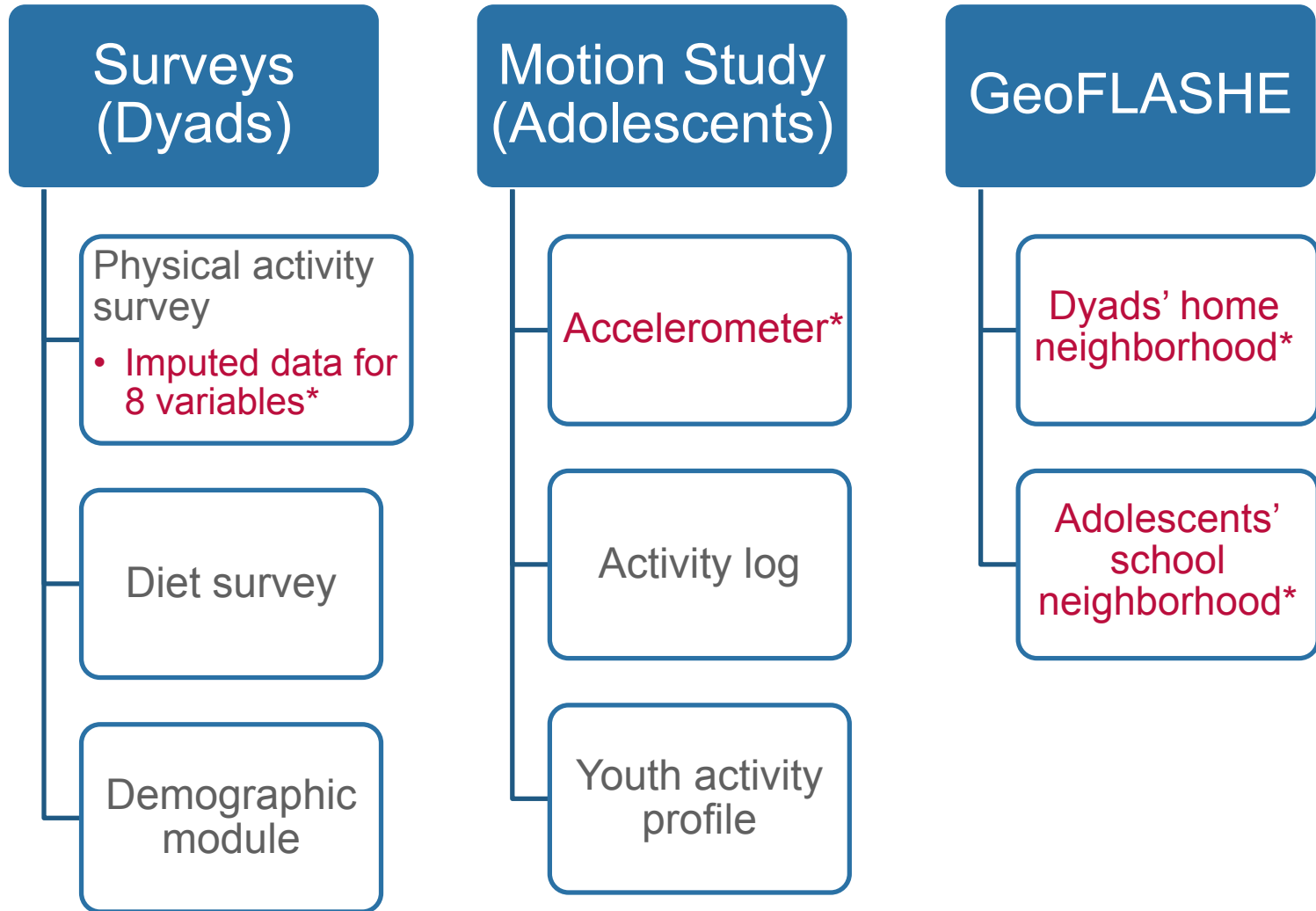| Dyadic analysis webinar	FLASHE overview webinar
• An introduction to cross-sectional dyadic analysis • Uses data from the FLASHE study as an example • Pairs with the annotated dyadic analysis sample code resource • https://cancercontrol.cancer.gov/brp/hbrb/flashe-webinar.html	• Describes the study design, sample sizes, and participant characteristics • Summaries survey constructs and outcome measures • Highlights example published findings using FLASHE • https://www.youtube.com/watch?v=X0pFMBmgr0M&feature=youtu.be

FLASHE Data Sources
(Today's content highlighted in red and *)

Surveys (Dyads)

- Physical activity survey
  - Imputed data for 8 variables*
- Diet survey
- Demographic module

Motion Study (Adolescents)

- Accelerometer*
- Activity log
- Youth activity profile

GeoFLASHE

- Dyads' home neighborhood*
- Adolescents' school neighborhood*

FLASHE Data Use Highlights

- FLASHE survey data continue to be used in 2018, including in publications, conference presentations, dissertations, and theses.

- Recent FLASHE publications feature individual- and dyad-level analyses and multiple outcomes, including:

  - fruit/vegetable intake,

  - energy-dense nutrient-poor foods and sugary beverages,

  - physical activity behaviors and barriers, and

  - indoor/outdoor tanning.

- This webinar's purpose is to highlight additional ways that the FLASHE data can be used and new opportunities for linking the earlier survey data sets with new types of data.
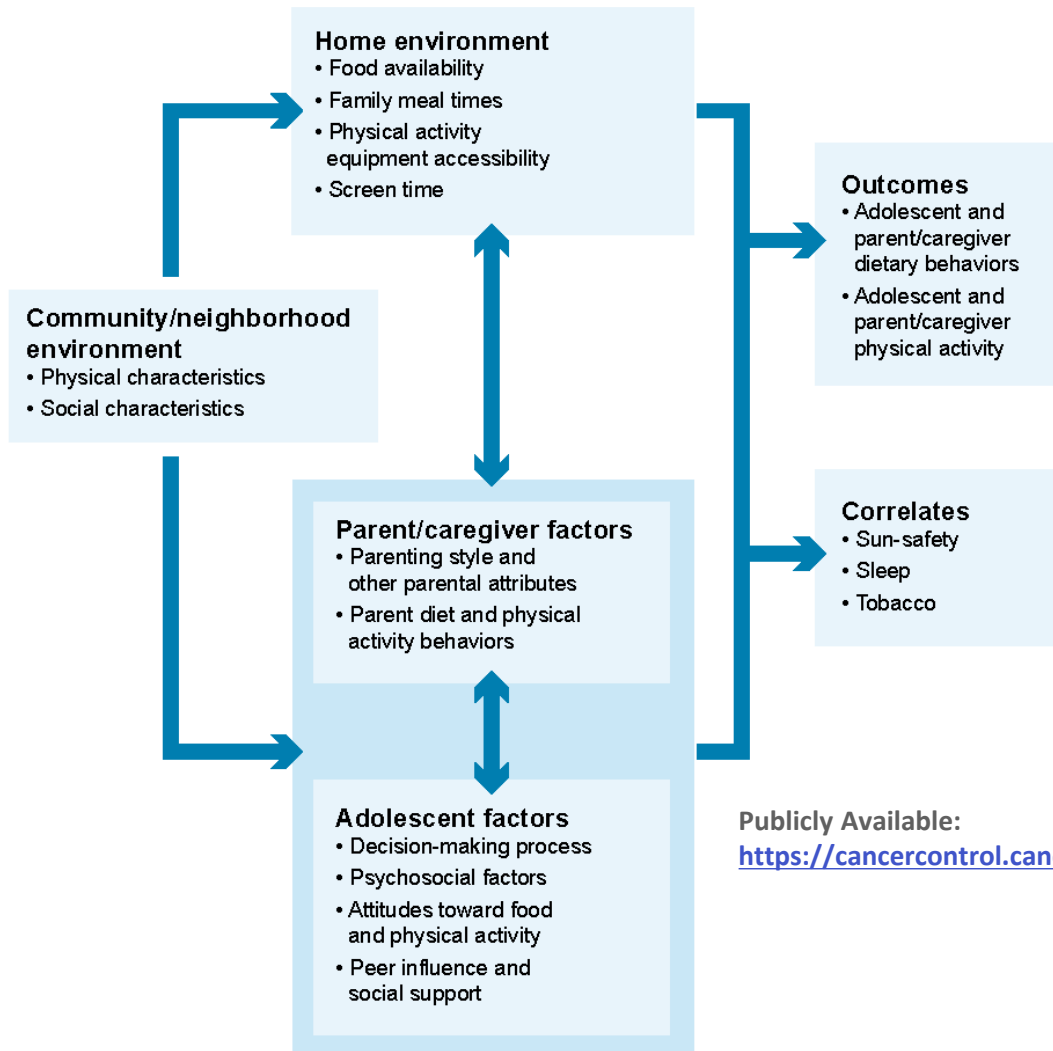
GeoFLASHE Public Use Data

April Oh, Ph.D., M.P.H.

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National Cancer Institute

Family Life, Activity, Sun, Health and Eating (FLASHE) Study: Conceptual Framework

GeoFLASHE: A geospatial extension of FLASHE

Home environment
- Food availability
- Family meal times
- Physical activity equipment accessibility
- Screen time

Community/neighborhood environment
- Physical characteristics
- Social characteristics

Parent/caregiver factors
- Parenting style and other parental attributes
- Parent diet and physical activity behaviors

Adolescent factors
- Decision-making process
- Psychosocial factors
- Attitudes toward food and physical activity
- Peer influence and social support

Outcomes
- Adolescent and parent/caregiver dietary behaviors
- Adolescent and parent/caregiver physical activity

Correlates
- Sun-safety
- Sleep
- Tobacco

Publicly Available:
https://cancercontrol.cancer.gov/brp/hbrb/flashe-files.aspx

Geocoded Data

- The FLASHE demographic survey asked parents two sets of open-ended questions about the location of their home and their adolescent's school:

    - Can you tell me just the name of the street/road you live on?

    - And what is the name of the nearest cross street/road?

    - Can you tell me just the name of the street/road teen's school is on?

   - And what is the name of the nearest cross street/road?

GeoFLASHE study

- Addresses geocoded for two data sets:
  - Parent **home** addresses **(n=1,736, 90.9%)**
  - Adolescents' **school** addresses **(n=1,580, 82.8%)**
- Inclusion criteria: individuals who reported street name
- Exclusion criteria: no response or missing, homeschooling
- Buffers were generated based on assumptions of walking 10-15 minutes at an average pace of 20 minutes/mile (Bohannon, 1997)

Methods: Circular and Street Network Buffers
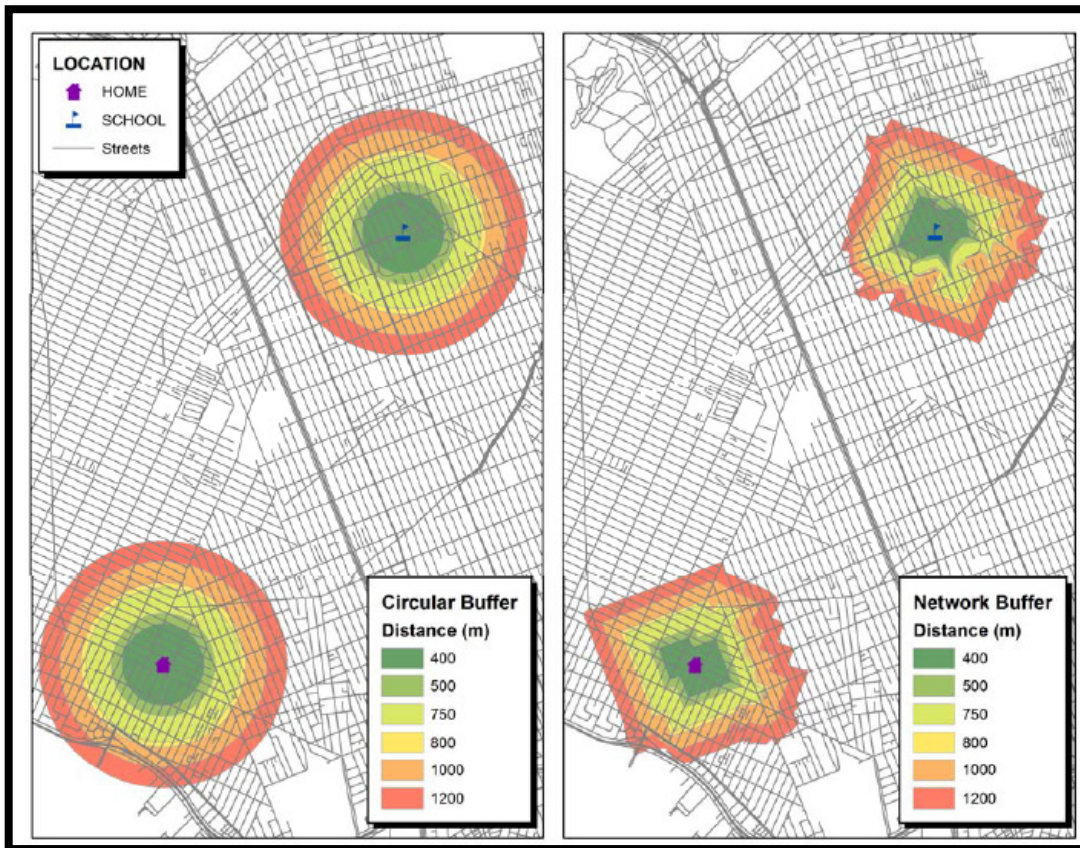
- 400, 500, 750, 800, 1,000 and 1,200 meters

- Census Tract

Neighborhood Measures
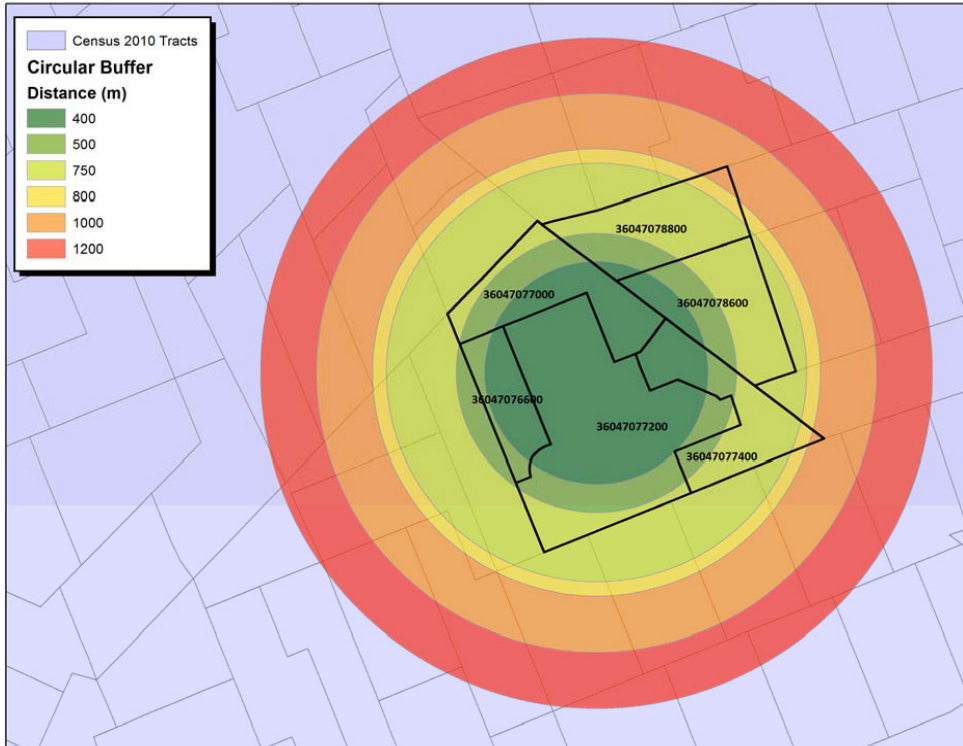
- Neighborhood SES: Yost Index

- Neighborhood measures: built environment characteristics

- UV exposure measures

- Urban-rural location

- Distance from home to school
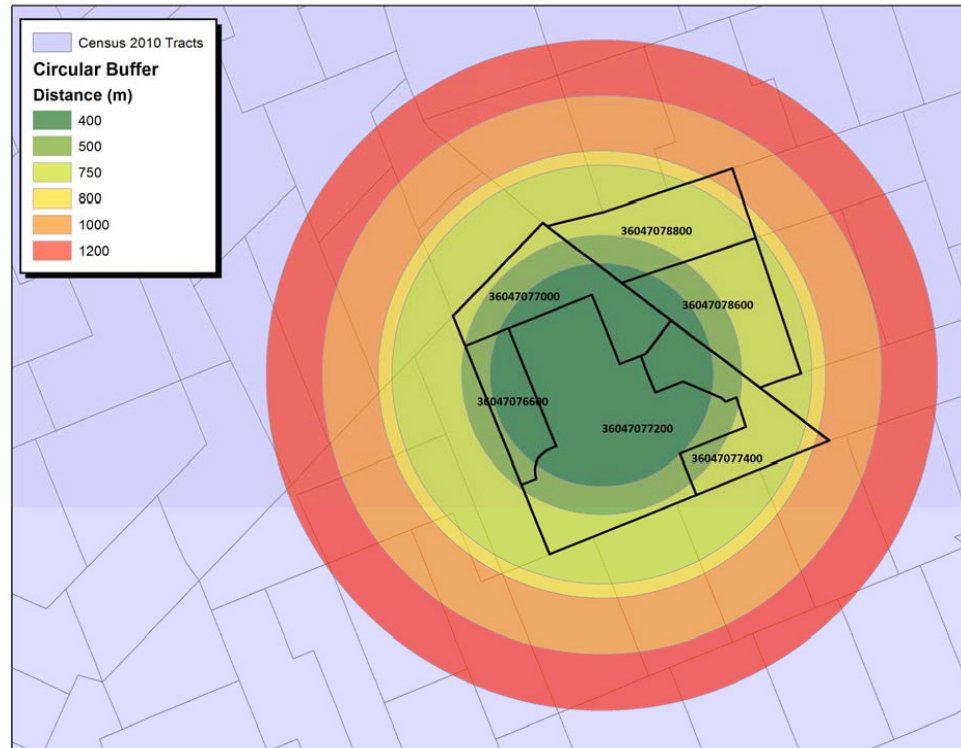
Neighborhood Calculation of Measures: Step 1

Table 1 – Example of buffer percentage calculations

DYADID	Location	Buffer Type	Buffer Size	Tract	Buffer Percentage
N	SCHOOL	CIRCULAR	400	36047076600	11.61%
N	SCHOOL	CIRCULAR	400	36047077000	17.36%
N	SCHOOL	CIRCULAR	400	36047077200	55.68%
N	SCHOOL	CIRCULAR	400	36047077400	8.71%
N	SCHOOL	CIRCULAR	400	36047078600	5.41%
N	SCHOOL	CIRCULAR	400	36047078800	1.24%

Neighborhood Calculation of Measures: Step 2
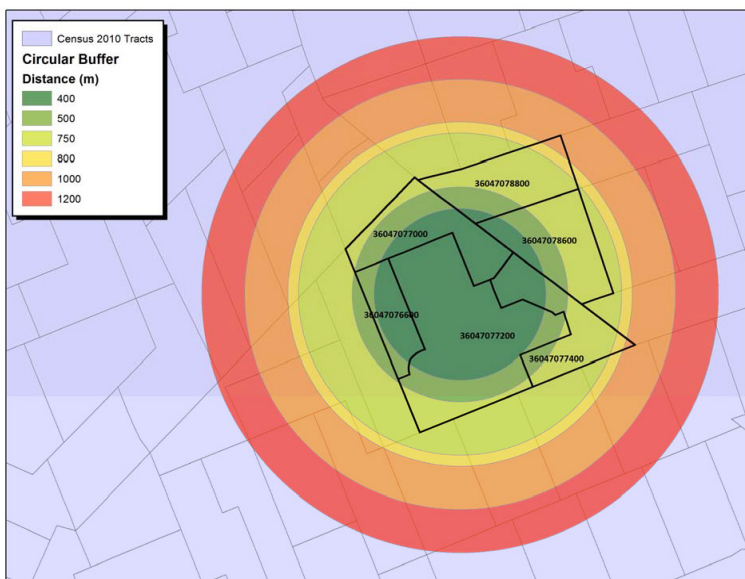

Table 2 – Example of a weighted neighborhood variable calculation

Tract	Tract % Hispanic	Buffer Percentage	Weighted % Hispanic
36047076600	11.55%	11.61%	1.34%
36047077000	15.69%	17.36%	2.72%
36047077200	12.20%	55.68%	6.79%
36047077400	12.46%	8.71%	1.09%
36047078600	8.25%	5.41%	0.45%
36047078800	4.40%	1.24%	0.05%
		Total % Hispanic:	12.44%

$$\frac{\sum_{i=1}^{n} M_i w_i}{n}$$

Where M_i is the census-based measure for tract i and w_i is the buffer percentage for tract i.

Neighborhood Walkability Factors

High density
- Higher population density
- More attached units (apartments)
- Fewer detached homes
- Fewer owner-occupied homes

Older homes
- More homes built before 1950
- Fewer homes built after 1970
- Earlier median year structure was built

Short commutes
- More commutes <20 minutes
- Fewer commutes by public transportation
- Lower population density

Neighborhood Socioeconomic Status (SES)

SES Domain

- Occupation
- Unemployed
- Poverty
- Income
- Education
- Housing

US Census Variable*

- % Working Class
- % Unemployed
- % Persons below 150% Poverty line
- Median HH Income
- Education Index
- Median House Value
- Median Rent

*American Community Survey 2010-14 ; Yu, et al, 2014; Yost K, et al, 2001
NCI https://cancercontrol.cancer.gov/brp/hbrb/docs/GeoFLASHE-Methods-Report-NCI.pdf

https://cancercontrol.cancer.gov/brp/hbrb/flashe-files.aspx

https://cancercontrol.cancer.gov/brp/hbrb/docs/GeoFLASHE-Methods-Report-NCI.pdf

FLASHE Imputed Survey Data

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The Missing Data

- Due to a system error, among the 1,802 final respondents in the Parent Physical Activity Survey, 951 respondents (53%) had eight variables all missing.

    - This missingness was accounted for in the group of parents that had received the Physical Activity Survey second, after completing the Diet Survey.

    - The identified system error did not enable those parents to access the eight questions.

- Multiple imputation was used to impute the missing data for the eight variables

    - Before imputation, we tested whether the missing data are MCAR through cross-tabs and chi-square tests of the missing-skip and parent socio-demographics. The missing-skip was dependent to parent gender and work status.

Variables to be Imputed

Variable name	Survey question
PPFEELLOVE	When my teenager is an adult, he/she will feel that there are people who really love him/her
PPOTHBETTER	The things my teenager will do as an adult will make other people's lives better
PPGETGDGRAD	My teenager will get good grades in school
PPATTRACTV	People will often comment about how attractive my teenager looks as an adult
PPJOBPAYWL	When my teenager is an adult, he/she will have a job that pays well
PPHCPALIMIT	Has a doctor or other healthcare professional ever told you that teen has any condition that could limit his/her ability to exercise, such as obesity, asthma, diabetes, high blood pressure, etc
PPHCPASPORT	Do medical, behavioral or other health conditions interfere with teen's ability to participate in sports, clubs or other organized physical activities
PPHCPAOUT	Do medical, behavioral or other health conditions interfere with teen's ability to go on things such as the park, library, zoo, shopping, church, restaurants or family gatherings

Multiple Imputation Methods Considered

- **Sequential regression imputation method (SRIM)**, implemented using IVEware (http://www.isr.umich.edu/src/smp/ive/), to simultaneously fill in these item missing data.

  - Imputation models include multiple linear regressions for continuous variables, logistic regressions for binary variables, and polytomous regressions for categorical variables.

- **The Cox-Iannacchlone Weighted sequential hotdeck (WSHD) imputation** (Cox, 1980; Cox & Folsom, 1981), implemented using SUDAAN 11.

  - It requires defining a set of categorical variables that determine the imputation classes.

Multiple Imputation Results (n=1,802)

- Sensitivity analysis based on 10, 20, and 50 sets of multiply imputed data indicated 20 sets of multiply imputed data is reasonable.

- With 20 sets of multiply imputed data from both imputation methods, the WSHD consistently showed better results in terms of several evaluation criterion compared to those of SRIM.

- Some of the very small categories in PPFEELLOVE, PPOTHBETTER, PPGETGDGRAD, and PPJOBPAYWL at the lower end of the five-point Likert Scale were collapsed to increase the cell size for imputation. Similarly, category 3 (I don't know) for PPHCPALIMIT was collapsed with category 2.

Multiple Imputation Evaluation (n=826)

- Simulation study using the 826 respondents with fully observed data was conducted.

- Simulated data mimicking the original missing patterns was generated and was repeated 100 times.

- The WSHD resulted in a smaller percentage of relative bias and coverage rate closer to the nominal value (0.95).

> The WSHD was finally used to create 20 sets of multiply imputed data.

     – The variable _mult_(with values from 1 to 20) is used to separate the 20 sets.

Liu, B., Hennessy, E., Oh, A., Dwyer, L.A., and Nebeling, L. (2018). Comparison of Multiple Imputation Methods for Categorical Survey Items with High Missing Rates: Application to the Family Life, Activity, Sun, Health and Eating (FLASHE) Study. *Journal of Modern Applied Statistical Method*, 17(1), eP2511. doi: 10.22237/jmasm/1536146540

How to Analyze the Multiply Imputed FLASHE Data

Three Steps:

1. Analyze each of the 20 completed data sets separately using methods and software appropriate for FLASHE data;

2. Extract the point estimate and the estimated standard error from each analysis;

3. Combine the estimates and standard errors using Rubin's (1987) combining rules to arrive at a single point estimate, estimated standard error, and the associated confidence interval or significant test.

Rubin, D.B. (1987). *Multiple Imputation for Nonresponse in Surveys* Wiley, New York.

Rubin's Combining Rule:

Let θ denote the statistics of interest. Let θ_i and U_i denote the point estimate and associated variance computed from the $i-$th multiply imputed data, $i = 1, \ldots, M$. The combined point estimate for θ:

$$\overline{\theta} = \frac{1}{M}\sum_{i=1}^{M}\theta_i$$

The associated variance with $\overline{\theta}$ is:

$$T = \overline{U} + \left(1 + \frac{1}{M}\right)B,$$

Where the within imputation variance $\overline{U} = \frac{1}{M}\sum_{i=1}^{M}U_i$, the between imputation variance $B = \frac{1}{M-1}\sum_{i=1}^{M}(\theta_i - \overline{\theta})^2$.

The 95% confidence interval bounds for $\overline{\theta}$ is:

$$\overline{\theta} \pm 1.96 * \sqrt{T}$$

Example Code Using SAS-callable SUDAAN & SAS PROC MIANALYZE

```
proc crosstab data=parent_imp_WSHD20

filetype = sas design = wr; nest _one_;

weight wt_p_pa;

class _mult_ PPFEELLOVE_R;

table _mult_*PPFEELLOVE_R;

*print / style=nchs;

output NSUM ROWPER
SEROW/filename=imp_WSHD_wgtfreq filetype=SAS
replace;

run;

 /*keep only percent & stderr by _mult_*/

data imp_WSHD_wgtfreq;

set imp_WSHD_wgtfreq;

if _mult_>0 and PPFEELLOVE_R>0;

keep _mult_ PPFEELLOVE_R NSUM ROWPER SEROW;

run;
```

```
proc sort data=imp_WSHD_wgtfreq; by
PPFEELLOVE_R; run;


ods trace on/listing;

proc mianalyze data=imp_WSHD_wgtfreq;

  modeleffects ROWPER;

   stderr SEROW;

by PPFEELLOVE_R;

ods output VarianceInfo=PPF_Var_MI
ParameterEstimates=PPF_Freq_MI;

run;

ods trace off;
```

Other analysis procedures may be used depending on analysis plans, but the final combining procedure should be the same.

FLASHE Adolescent Accelerometer Data
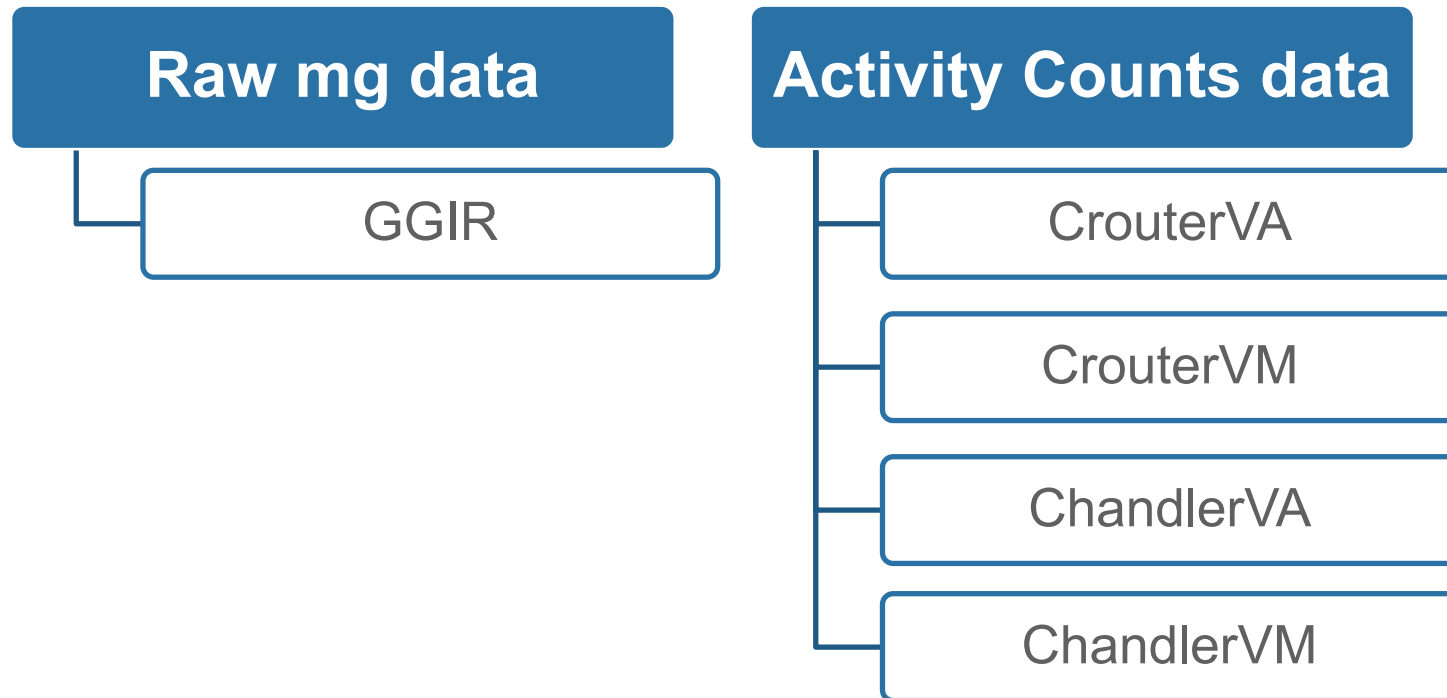
Youngwon Kim, Ph.D.

Assistant Professor
Department of Health, Kinesiology, and Recreation
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Overview of Motion Study

- 561 adolescents in the accelerometer data

- Actigraph GT3X+ data from the dominant wrist over 7 days

- Accelerometers were sent and received via mail.

- Sampling rate – 100 Hz

FLASHE Study Methodology Report (2015)

Accelerometer Data Processing

- Actigraph GT3X+ produces both <u>raw</u> and <u>activity counts</u> data
- All data processed in 5-sec epochs

Raw mg data	**Activity Counts data**
GGIR	CrouterVA
	CrouterVM
	ChandlerVA
	ChandlerVM

Processing Methods Used

Cut-points	Raw data	Activity counts data			
	GGIR (mg)	CrouterVA	CrouterVM	ChandlerVA	ChandlerVM
Sedentary behavior	mg≤ 32.9	Counts/5s≤ 35	VM/5s≤ 100	Counts/5s≤ 161	VM/5s ≤305
Light	32.9< mg ≤370	35< Counts/5s ≤360	100< VM/5s ≤ 609	162≤ Counts/5s ≤529	306 ≤ VM/5s ≤817
Moderate	370< mg ≤707.0	360< Counts/5s ≤1129	609< VM/5s ≤1809	530≤ Counts/5s ≤1461	818 ≤ VM/5s ≤1968
Vigorous	mg> 707.0	Counts/5s >1129	VM /5s> 1809	Counts/5s≥ 1462	VM/5s ≥1969

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4 Processed Data Sets to be Released

1. Least processed variables

2. Crouter variables (+ Least processed variables)

3. Chandler variables (+ Least processed variables)

4. GGIR variables (+ Least processed variables)

1. Least processed variables

Variables	Descriptions
AccID	Accelerometer ID
pid	Participants' ID
timestamp	Time stamps from accelerometers
Date	Date information extracted from "timestamp"
dayofyear	A numeric variable indicating a specific day in a year (e.g., 1 for Jan 1st, 365 for Dec 31st)
Time	Time information extracted from "timestamp"
minofday	A numeric variable indicating a specific minute in a day (e.g., 0 for midnight, 1 for 00:01:00, and 2 for 00:02:00, etc.)
Axis1	Activity counts from Axis 1
Axis2	Activity counts from Axis 2
Axis3	Activity counts from Axis 3
VectorMagnitude	Vector Magnitudes
Lux	Lux
ENMO_average	An average value of ENMO during the 1-minute period; ENMO is a composite score of three axes based on raw acceleration data
Timezone_difference	Timezone difference in hours

2. Crouter variables (+ Least processed variables)

Variables	Descriptions
Crouter_SED_VA	A proportion of the corresponding minute defined as sedentary time using Crouter's vertical axis cut-points (e.g., 0.5 indicates that 30 seconds of the 1 minute period were considered sedentary)
Crouter_LPA_VA	A proportion of the corresponding minute defined as light PA time using Crouter's vertical axis cut-points
Crouter_MVPA_VA	A proportion of the corresponding minute defined as MVPA time using Crouter's vertical axis cut-points
Crouter_MPA_VA	A proportion of the corresponding minute defined as moderate PA time using Crouter's vertical axis cut-points
Crouter_VPA_VA	A proportion of the corresponding minute defined as vigorous PA time using Crouter's vertical axis cut-points
Crouter_SED_VM	A proportion of the corresponding minute defined as sedentary time using Crouter's vector magnitude cut-points
Crouter_LPA_VM	A proportion of the corresponding minute defined as light PA time using Crouter's vector magnitude cut-points
Crouter_MVPA_VM	A proportion of the corresponding minute defined as MVPA time using Crouter's vector magnitude cut-points
Crouter_MPA_VM	A proportion of the corresponding minute defined as moderate PA time using Crouter's vector magnitude cut-points
Crouter_VPA_VM	A proportion of the corresponding minute defined as vigorous PA time using Crouter's vector magnitude cut-points

3. Chandler variables (+ Least processed variables)

Variables	Descriptions
Chandler_SED_VA	A proportion of the corresponding minute defined as sedentary time using Chandler's vertical axis cut-points
Chandler_LPA_VA	A proportion of the corresponding minute defined as light PA time using Chandler's vertical axis cut-points
Chandler_MVPA_VA	A proportion of the corresponding minute defined as MVPA time using Chandler's vertical axis cut-points
Chandler_MPA_VA	A proportion of the corresponding minute defined as moderate PA time using Chandler's vertical axis cut-points
Chandler_VPA_VA	A proportion of the corresponding minute defined as vigorous PA time using Chandler's vertical axis cut-points
Chandler_SED_VM	A proportion of the corresponding minute defined as sedentary time using Chandler's vector magnitude cut-points
Chandler_LPA_VM	A proportion of the corresponding minute defined as light PA time using Chandler's vector magnitude cut-points
Chandler_MVPA_VM	A proportion of the corresponding minute defined as MVPA time using Chandler's vector magnitude cut-points
Chandler_MPA_VM	A proportion of the corresponding minute defined as moderate PA time using Chandler's vector magnitude cut-points
Chandler_VPA_VM	A proportion of the corresponding minute defined as vigorous PA time using Chandler's vector magnitude cut-points

4. GGIR variables (+ Least processed variables)

Variables	Descriptions
GGIR_SED_ENMO	A proportion of the corresponding minute defined as sedentary time using ENMO cut-points
GGIR_LPA_ENMO	A proportion of the corresponding minute defined as light PA time using ENMO cut-points
GGIR_MVPA_ENMO	A proportion of the corresponding minute defined as MVPA time using ENMO cut-points
GGIR_MPA_ENMO	A proportion of the corresponding minute defined as moderate PA time using ENMO cut-points
GGIR_VPA_ENMO	A proportion of the corresponding minute defined as vigorous PA time using ENMO cut-points

Research Paper Using Accelerometer Data

AMERICAN JOURNAL OF
Preventive Medicine
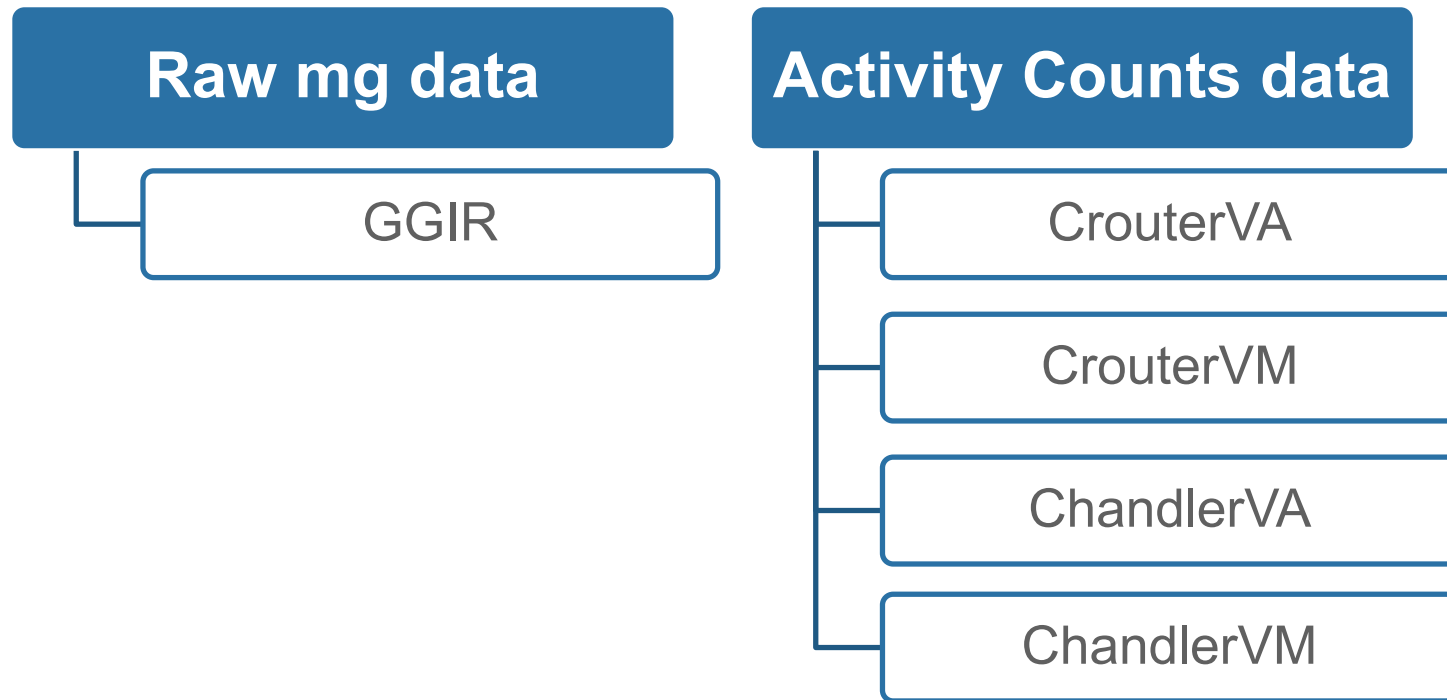
RESEARCH METHODS

Surveillance of Youth Physical Activity and Sedentary Behavior With Wrist Accelerometry

Youngwon Kim, PhD,[1,2] Paul Hibbing, MS,[2] Pedro F. Saint-Maurice, PhD,[2] Laura D. Ellingson, PhD,[2] Erin Hennessy, PhD, MPH,[3] Dana L. Wolff-Hughes, PhD,[4] Frank M. Perna, PhD,[5] Gregory J. Welk, PhD[2]

Comparison of Raw vs. Counts Data

- Actigraph GT3X+ monitor on the **wrist** over 7 days
- Actigraph GT3X+ produces both raw and activity counts data

Raw mg data	Activity Counts data
GGIR	CrouterVA
	CrouterVM
	ChandlerVA
	ChandlerVM

Kim et al. (2017) Amer J Prev Med

Processing Methods Used

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Vigorous	mg> 707.0	Counts/5s >1129	VM /5s> 1809	Counts/5s≥ 1462	VM/5s ≥1969

Kim et al. (2017) Amer J Prev Med

Data reduction

- 628 ActiGraph data files received
    - 14 no activity counts
    - 2 system errors from GGIR
    - 110 with no demographic information
    - 94 with wear time <10 hours/day on ≥4 days
- **408 adolescents** in the analyses

Kim et al. (2017) Amer J Prev Med

Results

Min/Day	Sex	Raw data	Activity counts data			
		GGIR	CrouterVA	CrouterVM	ChandlerVA	ChandlerVM
Sedentary Behavior						
	Boys	647.0	566.1	536.9	703.4	668.1
	Girls	645.6	561.3	533.2	697.1	658.2
MVPA						
	Boys	12.4	107.5	123.4	52.8	65.1
	Girls	8.4	106.5	129.0	51.2	68.8

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Results

Min/Day	Age (yrs)	Raw data	Activity counts data			
		GGIR	CrouterVA	CrouterVM	ChandlerVA	ChandlerVM
Sedentary Behavior						
	12-14	635.6	551.0	518.6	691.6	651.6
	15-17	657.1	576.4	551.6	708.9	674.7
MVPA						
	12-14	12.8	114.0	134.4	57.4	73.3
	15-17	8.0	100.0	117.9	46.6	60.7

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Results

Min/Day	Weight Status	Raw data	Activity counts data			
		GGIR	CrouterVA	CrouterVM	ChandlerVA	ChandlerVM
Sedentary Behavior						
	NW	646.3	565.2	537.0	700.6	664.2
	OW/OB	646.4	562.1	533.2	699.9	662.0
MVPA						
	NW	11.2	107.1	126.0	52.5	67.3
	OW/OB	9.7	107.0	126.4	51.5	66.6

Kim et al. (2017) Amer J Prev Med

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References

- Kim et al. (2017) Surveillance of youth physical activity and sedentary behavior with wrist accelerometry. American Journal of Preventive Medicine. 52(6): 872-879

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- Family Life, Activity, Sun, Health, and Eating (FLASHE) Study Methodology Report. https://cancercontrol.cancer.gov/brp/hbrb/docs/FLASHE_Methods_Report.pdf

Questions?

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Thank you!

- For questions about FLASHE, please contact: nciflashe@nih.gov

- To receive information about future FLASHE data releases, sign up for the NCI Behavioral Research Program's e-newsletter: https://cancercontrol.cancer.gov/brpsubscribe

- Follow us on Twitter: @NCIBehaviors

- Today's webinar and list of Q&As (asked both leading up to and following the webinar) will be posted online: https://cancercontrol.cancer.gov/brpwebinars

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Appendix

- Is there a list of FLASHE projects or publications?

  - Email nciflashe@nih.gov for general information, questions about a specific topic area, or a pdf FLASHE publication list.

  - *2018 FLASHE publications:*

    Physical Activity:

    - Dwyer LA, Patel M, Nebeling LC, Oh AY. Independent associations and interactions of perceived neighborhood and psychosocial constructs on adults' physical activity. J Phys Act Health. 2018;15(5):361-368.

    - Wiseman KP, Patel M, Dwyer LA, Nebeling LC. Perceived weight and barriers to physical activity in parent-adolescent dyads. Health Psychol. 2018;37(8):767-774.

Appendix

Diet:

- Parks CA, Blaser C, Smith TM, et al. Correlates of fruit and vegetable intake among parents and adolescents: findings from the Family Life, Activity, Sun, Health, and Eating (FLASHE) study. Public Health Nutr. 2018;21(11):2079-2087.

- Odum M, Housman JM, Williams RD. Intrapersonal factors of male and female adolescent fruit and vegetable intake. Am J Health Behav. 2018;42(2):106-115.

- Cho D, Kim S. Interplay between self-efficacy and perceived availability at home and in the school neighborhood on adolescents' fruit and vegetable intake and energy-dense, low-nutrient food and sugary drink consumption. J Nutr Educ Behav. 2018; 50(9):856-867.

- Mbogori T. Perception of weight status is associated with consumption of fruits and vegetables by adolescents. J Nurt Educ Behav. 2018; 50(7):S15.

Tanning:

- Niu Z, Parmar V, Xu B, et al. Prevalence and correlates of intentional outdoor and indoor tanning among adolescents in the United States: Findings from the FLASHE survey. Prev Med Rep. 2018; 11:187-190.

Appendix

Dyadic:

- Lenne RL, Joyal-Desmarais K, Jones RE, et al. Parenting styles moderate how parent and adolescent beliefs shape each other's eating and physical activity: Dyadic evidence from a cross-sectional, U.S. National survey. Journal of Experimental Social Psychology. 2018; online ahead of print.

- Orehek E, Ferrer R. Parent instrumentality for adolescent eating and activity. Ann Behav Med. 2018; online ahead of print.

Methods:

- Liu B, Hennessy E, Oh A, et al. Comparison of multiple imputation methods for categorical survey items with high missing rates: Application to the Family Life, Activity, Sun, Health, and Eating (FLASHE) Study. Journal of Modern Applied Statistical Methods. 2018;17(1):Article 23.