ommended adoption of a standardized recording system for all in-flight medical emergencies. This may be redundant because each airline’s medical department keeps a record of emergencies and their outcome. If an emergency can be stabilized sufficiently to allow the flight to proceed without diversion, it saves the airline money, and for this reason if no other, there is a strong motivation to provide a truly useful kit.

The authors also recommended a standard kit be kept in identical locations on every flight. Standardization is difficult for 2 reasons. First, the different types of routes that an airline flies demand differing provisions. Second, there are problems with drug regulations if different jurisdictions are involved.

The enhancement and standardization of flight-attendant training in medical emergencies was a third recommendation. It is certainly possible to train flight attendants in first aid, but there are legal problems if they seek to do more. Many airlines look favorably on trained nurses as recruits for cabin staff, but it is not possible or cost-effective to have a trained nurse or paramedic on each flight. A wider view would suggest that such trained personnel would save more lives working in a ground-based service.

Finally, I suggest that the International Civil Aviation Organization require multilingual labeling and standard packaging for medical kits so that it is easy to find what is needed in the kit.

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In Reply: We disagree with the notion that a standard recording system for in-flight medical emergencies would be redundant. There is currently no standardized recording or review of in-flight medical emergencies. A recording of each incident in a standardized format in a national (or international) database would be a significant improvement from the current system in which there is neither mandatory reporting nor sharing of information. With a central database of incidents recorded and described in a standard format, it will be possible to learn from the aggregate of these episodes.

We believe that all emergency medical kits should contain the same supplies and medicines regardless of flight duration. In-flight medical emergencies occur wherever people are flying and on flights of any duration. Any difficulties with jurisdiction around medications could be overcome with appropriate legislation, similar to what has been provided for Good Samaritan laws. We agree with the author’s suggestion that the medical kit be clearly labeled.

Standardized training for flight attendants is critical, but we are not asking flight attendants to also be trained medical professionals. Rather, each flight attendant must clearly understand his or her role during in-flight medical emergencies. Attendants must know basic cardiopulmonary resuscitation, be knowledgeable about the contents of the emergency medical kit, and be trained to provide support to bystander responders.

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RESEARCH LETTER

Body Adiposity Index, Body Mass Index, and Body Fat in White and Black Adults

To the Editor: Body mass index (BMI) is widely used as a proxy for body fat and has been shown to correlate with other measures of adiposity. However, its use is limited by differences in body fatness for a given BMI across age, sex, and race. To address this limitation, Bergman et al developed the body adiposity index (BAI) in samples of Mexican-American and black individuals. However, no sex-specific information was provided, and it is unknown how well BAI performs in white individuals. We investigated the sex-specific relationship between both BMI and BAI and body fat in white and black adults.

Methods. The participants were mainly healthy volunteers recruited from the greater Baton Rouge area for metabolic studies from 1992 to 2011. This analysis included only adults with dual-energy x-ray absorptiometry measures. Because a focus of the study was to understand racial differences, race was self-identified. The study was approved by the institutional review board of the Pennington Biomedical Research Center, and participants provided written informed consent.

Height and weight were measured using a stadiometer and digital scale, respectively. Hip circumference was measured at the level of the trochanters. The BMI was calculated as weight in kilograms divided by height in meters squared, and BAI was calculated as hip circumference in centimeters divided by height in meters to the 1.5 power minus 18. Fat mass and percentage of body fat were measured using a Hologic QDR4500 (n = 1549, 2001-2011) or QDR2000 scanner (n = 2302, 1992-2006); QDR2000 data were converted to QDR4500 output (Hologic, Bedford, Massachusetts).

Pearson correlations were computed among BAI, BMI, fat percentage, and fat mass within each sex-by-race group. A linear regression model was used to assess the
relationship between fat percentage and BAI (or BMI), age, sex, and race. Interaction terms were entered into the model for sex × BAI (or BMI) and race × BAI (or BMI).

Results. The sample included 1462 white women, 812 black women, 1262 white men, and 315 black men. The mean (SD) age, BMI, and fat percentage of the sample were 41.0 (13.4) years (range 18-69 years), 29.4 (6.1) (range, 17.2-57.7), and 32.0% (9.7%) (range, 7.8%-55.9%), respectively. The correlations with fat percentage across the 4 sex-by-race groups ranged from 0.75 to 0.82 for BAI and 0.80 to 0.83 for BMI, and the correlations with fat mass ranged from 0.77 to 0.86 for BAI and 0.90 to 0.96 for BMI (TABLE).

The regression model that included BAI explained 81.9% of the variance in fat percentage. The corresponding model for BMI explained 84.1%. Women had 5.2% and 12.2% more fat percentage than men (P <.001) at the mean BAI and BMI, respectively, while white individuals had 0.7% and 1.6% more fat percentage than black individuals (P <.001) at the mean BAI and BMI, respectively. The race interaction term was not significant for BAI (P = .19), but it was for BMI (P <.001); however, both sex interaction terms were significant, indicating that the associations between BAI and BMI with fat percentage differed by sex and by race for BMI (FIGURE).

Comment. Body mass index and BAI perform similarly in predicting body fat. In each sex-by-race group, the correlations with fat percentage and fat mass were similar for BMI and BAI. Moreover, the regression models including BAI or BMI explained a similar percentage of the variance in fat percentage. The sex and race differences in the relationship between both BAI and BMI with fat percentage make interpreting these measures in different population groups difficult. Our results are based on a sample of volunteers enrolled in clinical studies, and the representativeness of the results is not known. Neither BMI nor BAI measure obesity complications directly, and further

| Table. BAI, BMI, Percentage of Body Fat, and Fat Mass and Correlations Among These Variables in the 4 Sex-by-Race Groups and the Total Sample |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                   | BAIa            | BMIb            | Fat %           | Fat Mass, kg    | Fat % and BAI   | Fat % and BMI   | Fat Mass and BAI| Fat Mass and BMI|
| Black women (n = 812) | 35.3 (6.3)      | 31.6 (6.5)      | 37.9 (6.0)      | 32.8 (11.2)     | 0.77 (0.74-0.80) | 0.80 (0.77-0.82) | 0.81 (0.79-0.84) | 0.94 (0.93-0.95) |
| Black men (n = 315)  | 26.0 (4.2)      | 28.6 (4.7)      | 27.4 (6.1)      | 20.2 (9.2)      | 0.76 (0.71-0.80) | 0.80 (0.76-0.84) | 0.77 (0.72-0.81) | 0.90 (0.88-0.92) |
| White women (n = 1462)| 34.2 (6.9)      | 29.2 (6.7)      | 37.5 (7.3)      | 30.3 (12.1)     | 0.82 (0.80-0.83) | 0.83 (0.81-0.84) | 0.85 (0.85-0.88) | 0.96 (0.95-0.96) |
| White men (n = 1262)| 26.3 (4.4)      | 28.5 (5.1)      | 27.1 (4.5)      | 23.8 (10.3)     | 0.75 (0.73-0.77) | 0.79 (0.77-0.83) | 0.77 (0.74-0.79) | 0.91 (0.90-0.92) |
| Total (n = 3851)     | 31.1 (7.2)      | 29.4 (6.1)      | 32.0 (9.7)      | 27.6 (11.9)     | 0.85 (0.84-0.86) | 0.65 (0.64-0.67) | 0.83 (0.82-0.84) | 0.91 (0.90-0.92) |

Abbreviations: BAI, body adiposity index; BMI, body mass index; CI, confidence interval.
aAll correlations statistically significant at P <.001.
bCalculated as weight in kilograms divided by height in meters to the 1.5 power minus 18.

P values for centered main effects and interactions are from a regression model including body adiposity index (BAI) or body mass index (BMI), age, sex, race, and sex × BAI (sex × BMI) and race × BAI (race × BMI) interactions. For BMI centered effects, sex β = −5.2 (P <.001), race β = −0.7 (P <.001). For BMI centered effects, sex β = −12.2 (P <.001); race β = −1.6 (P <.001). The race × BAI interaction had P = .19; the 3 other interactions (sex × BAI, sex × BMI, and race × BMI) had P <.001. The lines indicate the linear relationships between the 2 variables.
research is required to determine the clinical significance of these measures.

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Author Contributions: Dr Katzmarzyk had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study design: Barreira, Harrington, Staiano, Heymsfield, Katzmarzyk. Analysis and interpretation of data: Barreira, Harrington, Staiano, Heymsfield, Katzmarzyk. Critical revision of the manuscript for important intellectual content: Barreira, Staiano. Statistical analysis: Barreira, Harrington, Staiano, Heymsfield, Katzmarzyk. Study supervision: Katzmarzyk.

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The participation hypothesis— ... Significant changes in human behavior can be brought about rapidly only if the persons who are expected to change participate in deciding what the change shall be and how it shall be made.

—Herbert A. Simon (1916-2001)