The Health Index
MIDDLESEX-LONDON HEALTH UNIT
www.healthunit.com

PHYSICAL ACTIVITY LEVELS IN LONDON AND MIDDLESEX COUNTY

Issue 17, September 2005

KEY POINTS:

- Nearly 65% of adults in London & Middlesex County have activity levels that are health enhancing.
- Males and females have significantly different patterns of physical activity by age group.
- Physical activity levels decrease significantly in the 55-64 year old age group.
- Leisure-time physical activity has increased.
- London and Middlesex County have met and exceeded specific provincial targets for physical activity levels.

INDEX

BACKGROUND

An active lifestyle has long been considered an essential component of wellbeing. Strong health promotion efforts over the past three decades, have increased physical activity levels, however some residents in London and Middlesex County continue to be inactive. Research supports a broad range of health benefits of being at least moderately physically active including:

- increased longevity
- psychological well-being
- prevention and management of specific chronic diseases including cancer, heart disease, diabetes, osteoporosis as well as obesity. [1]

Despite these documented benefits associated with ongoing physical activity and promotional efforts over the past 30 years, increasing the rate of physical activity in the population continues to be of paramount concern for public health.

A recent Canadian analysis of longitudinal data assessed the factors associated with starting or sustaining physical activity during leisure time. [2] Not surprisingly, individual changes in the levels of leisure-time activity were shown to be relatively common. Many predictors of starting or sustaining activity were identified such as sex, age, educational attainment, smoking and sense of mastery or control of one's life. Some factors were found to be significant only for women and not for men. For example, overweight and the presence of children under 18 years of age at home were deterrents for women, but not for men. However, men were more likely to become or stay physically active if they were former smokers and more socially involved.

A number of key provincial reports have highlighted the need for public health to focus on physical activity and many have set targets or objectives for physical activity levels in the population. The Ontario Ministry of Health and Long-Term Care Mandatory Health Programs and Services Guidelines [3] identified the following behavioural objectives in 1997 to reduce the premature mortality and morbidity from preventable chronic diseases:

- to increase to 40 per cent the proportion of all adults who include at least 30 minutes of accumulated, moderate physical activity on most if not all days of the week by the year 2010,
- to increase to 60 per cent the proportion of youth who include at least 30 minutes of accumulated, moderate physical activity on most if not all days of the week by the year 2010,
- to increase the proportion of children who are active.

Although it is generally acknowledged that the Mandatory Guidelines need to be updated, all public health units in Ontario are required to implement them. Historically, they have been a key document and provide Middlesex-London Health Unit (Health Unit) with a mandate to support and implement initiatives to increase the level of the population that is physical activity in our community.

Since 1997 there have been other significant public health stakeholders that have set these objectives and established provincial targets for their own purposes related to physical activity levels. Specifically, the Cancer 2020 Summary Report released in May 2003 [4] established long-term provincial targets to prevent cancer in Ontario and monitor population level progress. The Cancer 2020 physical activity target calls for:

- At least 90% of Ontarians to participate in moderate to vigorous activity as defined in Canada's Physical Activity Guide. [5]

Moderate to vigorous activity according to Canada's Physical Activity Guide may include:

  - 60 minutes of light physical activity daily, or
  - 30 to 60 minutes of moderate physical activity four days/week, or
  - 20 to 30 minutes of vigorous physical activity at least three days per week.

In 2004, the Chief Medical Officer of Health Report focused on Healthy Weights, Healthy Lives. [6] This report identified that people's activity levels also affect weight and raised concerns about the extent of sedentary behaviour in the Ontario population. It made specific recommendations for action relevant to physical activity such as calling on:

- governments to develop a targeted, strategic, well resourced mass media campaign to among other things promote regular physical activity based on Canada's Physical Activity Guides to Healthy Active Living,
- governments to develop polices that promote physical activity including investigating the impact of user fees on recreational facility use, supporting safe active transportation options, supporting professionals with high quality training assistance, and supporting Active 2010,
- workplaces to create environments that implement strategies to help people be more physically active at work,
- schools to provide quality daily physical activity in schools,
- schools to help children be more physically active and encourage parents to support physical activity at home, and
- individuals to follow the Canada's Physical Activity Guide to Healthy Active Living.

Active 2010 is the most recent strategy to address physical activity levels in Ontario. Originally announced in 2004, primarily as an initiative of the Ontario Ministry of Tourism and Recreation, this initiative has now become the cornerstone of the new Ontario Ministry of Health Promotion with the August 2005 release of, Active 2010- Ontario's Sport and Physical Activity Strategy. [7] This document sets a provincial target to:

- increase to 55 per cent by 2010 the number of adults who will walk a minimum of 30 minutes daily (or participate in some other equivalent activity)

An intermediate target has also been identified of :

- 50 per cent of Ontarians will be classified as active by 2007 to ensure that progress is being achieved.

Locally, the Health Unit established three areas of focus for 2004/05 including "healthy living" as one of these primary areas. A specific goal was set to:

- increase the number of individuals in schools, community and workplaces who are physically active.

Just prior to establishing this risk factor related objective at the Health Unit, the Ontario Heart Health Program, began its second five-year phase in 2003. This second phase incorporated the Ontario Heart Health Evaluation recommendation from phase one to move from a heart health model to a more integrated chronic disease prevention model. This approach emphasizes the common underlying risk factors such as physical activity associated with many chronic diseases.

At the Health Unit phase two marked the transition from "Good Hearted Living" to the "Healthy Living Partnership" with a broader chronic disease focus. Programs and initiatives that support physical activity promotion throughout the life span in a variety of life settings such as schools, workplaces, community centres and organizations continue to be implemented. Examples range from walking promotion for all ages, pedometer challenges, Healthy Active School Award, Turn Off the Screens Week, Challenge of the Heart, and the Healthy Living Campaign.

This Health Index describes the total physical activity levels for aged 18 and over of the City of London and Middlesex County. This marks the first time that local estimates are available for a comprehensive set of physical activities using the International Physical Activity Questionnaire (IPAQ), which includes domestic and gardening (yard) activity, work-related and transportation related physical activity as well as leisure time activity [8]. IPAQ consists of a series of questions that ask the respondent to recall their physical activities in the past seven days. Total activity scores are then established that were further divided into activity categories. The "high" and "moderate" physically active categories are generally considered health-enhancing physical activity levels that exceed the minimum public health physical activity recommendations and indicate that enough physical activity is being accumulated for a healthy lifestyle. From January 10, 2004 (Wave 37) continuously through 2004 to the end of Wave 48 on January 9, 2005 total physical activity levels were collected from 1204 respondents through the Rapid Risk Factor Surveillance System (RRFSS). For more information please see the Methods section.

LEISURE-TIME PHYSICAL ACTIVITY LEVELS

Previous local reports [9,10] have focused on providing measures of leisure-time physical activity using data from the Canadian Community Health Survey (CCHS) (Table 1). This approach to measuring physical activity asks respondents aged 12 and older about physical activity during leisure time and does not consider other physical activities carried out during work or domestic chores (See Definitions). According to this measure 54.6% (± 3.2%) of residents of London and Middlesex County were physically active or moderately active in their leisure time in 2003 and this percentage increased significantly from 45.9% (± 3.2) in 2000/01.

On this measure of leisure-time physical activity, activity levels in London and Middlesex County were not significantly different from Ontario as a whole or from other Ontario peer health units that are similar in socio-economic indicators such as Ottawa Region. However, this indicator does not include all activities of daily living and specifically excludes those physical activities carried out during work or household chores.

Table 1: Leisure-Time Physical Activity for London and Middlesex County by Sex, Household Population 12 and Over, 2000/01 and 2003

Leisure-time Physical Activity	Percent 2000/01			Percent 2003		
	Males	Females	Total	Males	Females	Total
Physically Active	29.2(±4.0)	19.2(±3.2)	24.1(±2.6)	31.3(±4.0)	24.3(±3.6)	27.7(±2.7)
Moderately Active	20.3(±3.4)	23.3(±3.4)	21.8(±2.3)	27.5(±4.1)	26.4(±3.5)	26.9(± .7)
Physically Inactive	43.6(±4.6)	54.9(±4.1)	49.4(±3.3)	35.0(±4.3)	46.1(3.8±)	40.7(±3.0)
Not Stated	6.9(± 2.6)	2.6(± 1.4)	4.7(± 1.6)	6.2(± 2.6)	3.2(± 1.9)	4.7(± 1.7)

Source: CCHS, CANSIM, Health Indicators

Table 2: Physical Activity Levels (IPAQ) for London and Middlesex County by Sex, Aged 18+, Jan.-Dec. 2004

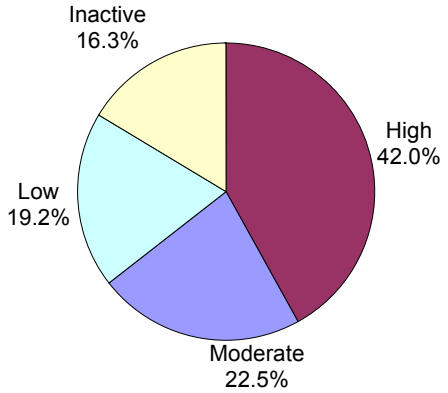
Physical Activity (IPAQ)	Male		Female	
	Percent (%)	Confidence Interval (%)	Percent (%)	Confidence Interval (%)
High	46.4	±4.3	38.4	±3.9
Moderate	22.2	±3.6	22.8	±3.4
Low	18.1	±3.3	20.1	±3.2
Inactive	13.4	±3.0	18.8	±3.1

Source: RRFSS, Waves 37-48, 2004

OVERALL TOTAL PHYSICAL ACTIVITY LEVELS

According to the more comprehensive IPAQ measurement used on RRFSS, 64.5% (± 2.8%) of adults aged 18 years and older in London and Middlesex County reported total physical activities in 2004, that would categorize them in either the high or moderate physically active group. Specifically, 42.0% (± 2.9%) of all adults were in the high physically active category and 22.5% (± 2.5%) were in the moderate physically active category. An additional 19.2% (± 2.3%) of adults reported low physically active levels and 16.3% (± 2.2%) were inactive (Figure 1).

Figure 1: Physical Activity Levels,
London & Middlesex County, Ages 18+, Jan.-Dec. 2004



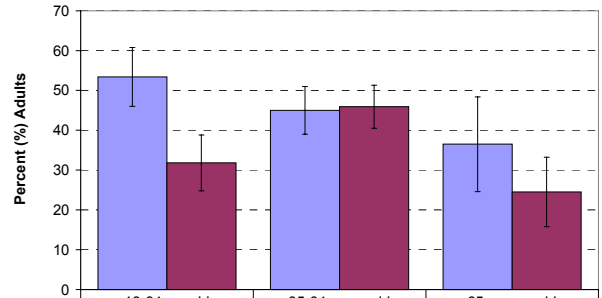
Source: RRFSS, Waves 37-48, 2004

GENDER DIFFERENCES IN PHYSICAL ACTIVITY LEVELS

There were no overall significant differences by gender in the percentage of residents in each of the four physically active levels. (Table 2).

Nevertheless there were noteworthy differences by gender when each age group was considered separately. Figure 2 illustrates the gender differences in percent of those adults that are in the high physically active level by three age groups. A significantly greater percentage of males in the 18-34 year old age group (53.4% ± 7.4%) were in the high physically active level as compared to females (31.8% ± 7.0%) in the same age group. The overall pattern by gender is also different. The percentage of males in the high physically active level appears to decrease incrementally with age (18-34 year olds 53.4% ± 7.4%; 35-64 year olds 45.0% ± 6.0%; 65+ year olds 36.5% ± 11.9%). However, physical activity in females increases from the youngest age group (31.8% ± 7.0%) to those females in the middle age group (45.9% ± 5.4%) and then significantly decreases in those females over 65 years of age (24.5% ± 8.7%).

Figure 2: High Physical Activity by Age Group by Gender,
London & Middlesex County, Age 18+, Jan.-Dec 2004



	18-34 yrs old	35-64 years old	65+ years old
Males	53.4	45	36.5
Females	31.8	45.9	24.5

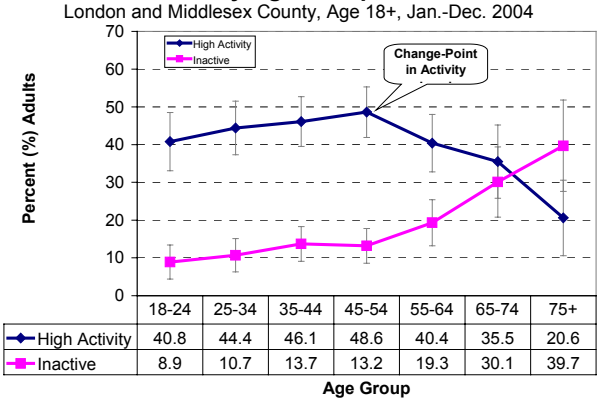
Source: RRFSS, Waves 37-48, 2004

This same pattern for each gender by age group exists when both high and moderately active levels are combined (not shown). A significantly greater percentage of males in the 18-34 year old age group (76.7% ± 6.2%) were moderately active or more highly active (moderate and high active levels combined) as compared to females (58.6% ± 7.4%) in the same age group. However, in females, the percentage appears to be maintained or possible increased from the youngest age group (18-34 year olds 58.6% ± 7.4%) to those females in the middle age group (35-64 year olds 67.1% ± 5.0%) and then significantly decrease in those females over 65 years of age (45.2% ± 10.1%).

AGE DIFFERENCES IN PHYSICAL ACTIVITY LEVELS

As noted in Figure 3, the percentage of adults that reported high physical activity levels increases slightly with age until middle age (45-54 year olds 48.6% ± 6.7%) and then begins to decline swiftly in the 55-64 year olds (40.4% ± 7.6%). Inversely, the percentage that are physical inactive appears to increase gradually into the older age groups, leveling off in the middle age group (45-54 year olds 13.2% ± 4.6%) and then noticeably increases in those of retirement age (55-64 year olds 19.3% ± 6.1%) and older (65+ years old 34.6% ± 7.5%), combined group not shown). Figure 3 further illustrates the change-point in the 55-64 year old age group for the percentages of adults in both the most active level and most inactive level by age group including additional older age groups of those 65-74 years old (30.1%, ± 9.3%) and 75 years and older (39.7% ± 12.1%). (The moderate and low physically active groups are not shown in Figure 3).

Figure 3: Physically Active and Physically Inactive by Age Group,
London and Middlesex County, Age 18+, Jan.-Dec. 2004



	18-24	25-34	35-44	45-54	55-64	65-74	75+
High Activity	40.8	44.4	46.1	48.6	40.4	35.5	20.6
Inactive	8.9	10.7	13.7	13.2	19.3	30.1	39.7

Age Group

Source: RRFSS, Waves 37-48, 2004

EDUCATION DIFFERENCES IN PHYSICAL ACTIVITY LEVELS

The relationship between physical activity level and education is complex and it is difficult to detect the underlying patterns. This is confounded by the fact that there are underlying differences in age groups and that these differences have not been controlled for. Generally, there were no significant differences in the percentage of residents in the high physical active level by education group. However, there did appear to be a non-significant trend towards decreasing levels of inactivity with higher educational attainment (less than high school 23.3% ± 7.7%; high school and some post-secondary education 17.8 % ± 3.7%; post-secondary education 13.5% ± 2.8%) (Table 3). However, a greater percentage of those with post-secondary education were in the moderate physically active level and low physically active level rather than the high physically active level as compared to other education levels. For example, there was a significantly greater percentage of post secondary graduates in the moderate physically active level (25.9 ± 3.5%) as compared to the percentage of those with high school and some post-secondary education in the moderate physically active level (17.8% ± 3.7%).

INCOME DIFFERENCES IN PHYSICAL ACTIVITY LEVELS

As with education the relationship between income groups and physical activity levels was intricate. Here there also appeared to be increasing levels of physical activity with higher income groups (Figure 4). Generally, there was a significantly greater percentage of adults who were moderately active or more highly active (moderate and high active levels combined) in the highest household income group ($100,000 and over 72.0% ± 7.7%) as compared to those in the lowest household income group (below $40,000 57.4% ± 5.4%). There was only one significant difference between the income groups when comparing each of the four physical activity levels. There was a significantly higher percentage of those in the lowest household income group of below $40,000 that were in the low physically active level (24.2% ± 4.7%) as compared to those in the highest household income level of $100,000 or more (13% ± 5.8%) (not shown).

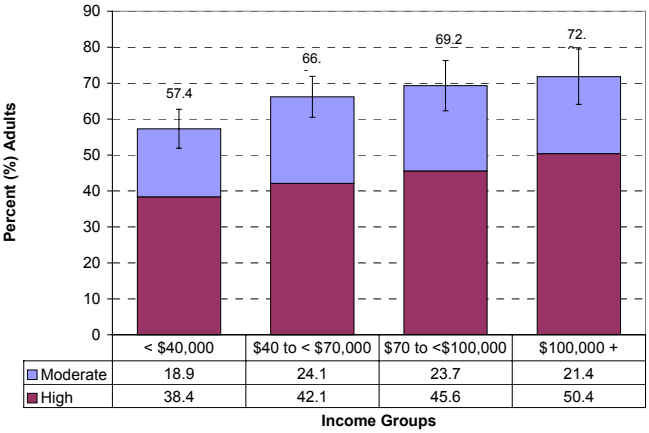
Table 3: Physical Activity Levels (IPAQ) for London and Middlesex County by Education levels, Aged 18+, Jan.-Dec. 2004

Physical Activity (IPAQ)	< HS		HS +		Post 2nd Grad	
	Percent (%)	Confidence Interval (%)	Percent (%)	Confidence Interval (%)	Percent (%)	Confidence Interval (%)
High	44.8	9.0	43.5	4.9	40.6	4.0
Moderate	22.4	7.6	17.8	3.7	25.9	3.5
Low	9.5	5.3	21.0	4.0	20.0	3.2
Inactive	23.3	7.7	17.8	3.7	13.5	2.8

Source: RRFSS, Waves 37-48, 2004

Figure 4: Physically Active (Moderate/ High) by Income Groups

London & Middlesex County, Age 18+, Jan.-Dec. 2004



Source: RRFSS, Waves 37-48, 2004

PLACE OF RESIDENCE

There were no significant differences by activity level in the City of London (41.3% ± 3.4%) as compared to the County of Middlesex (44.1% ± 5.7%). This was consistent for all physical activity levels.

PRESENCE OF MULTIPLE RISK FACTORS

Although physical activity provides health benefits independent from other modifiable risk factors, the presence of multiple risk factors including physical inactivity identifies those at amplified risk for chronic diseases. The percentage of adults in London and Middlesex County with multiple risk factors was 12.3% (± 2.5%). This percentage reflects those adult residents with all three of the following risk factors:

- Lower physical activity (low and inactive levels),
- Overweight or obese (International standard of BMI of 25 or greater), and
- poor eating behaviours.

Those with poor eating behaviours were specifically defined as those that did not consume the minimum recommended servings of five fruits or vegetables per day. Due to the inclusion of fruit and vegetable consumption questions on the RRFSS for only the first eight waves of the year (Waves 37-44) only those respondents asked between January and August 2005 were included in this analysis.

There was no significant difference in the percentage of males that had all three risk factors (14.2% ± 3.9%) as compared to females (10.8% ± 3.1%). There was a significant difference between those aged 18-34 years old (5.9% ± 3.1%) as compared to those in the 35-64 year old age group (15.2% ± 3.7%) and those in the 65 and older age group (18.1% ± 8.3%). There were no significant differences by education, income or place of residence (City of County).

HOW ARE WE DOING?

The leisure-time physical activity measures from the CCHS indicate that leisure-time physical activity levels improved for residents of London and Middlesex age 12 and older. Documented gains from a rate of 45.9% in 2000/01 to 54.6% in 2003, suggests the London and Middlesex area has already met the provincial target set by Active 2010. Using the more comprehensive IPAQ survey on RRFSS that measures work/ transportation and domestic related activities as well as leisure-time activities, indicated that 64.5% (± 2.8%) of adults aged 18 and older were accumulating enough physical activity for a healthy lifestyle (high and moderate physically active categories). This percentage of residents that are in the "health enhancing physical activity"(HEPA) levels exceed the minimum public health physical activity recommendations as identified by the Canadian Physical Activity Guide. In London and Middlesex County all but the 16.3%(± 2.2) of the population were classified as inactive, nearly 84% of adults meet the minimum public health physical activity recommendations. Therefore we are well on our way to having all adults meet the Cancer 2020 target to have 90% of residents meet the physically active guidelines set out in the Canada's Physical Activity Guide.

Specialists in this field of physical activity measurement caution that the IPAQ categories have not yet been supported by epidemiological studies which typically have used only leisure-time physical activity to examine the benefits or risk of being active. [8] Despite the fact that even those residents in the low physically active category are meeting the minimum public health physical activity requirements, many of these individuals may not be actually accumulating enough physical activity for a healthy lifestyle. Therefore, it may be prudent to specifically aim for the population to meet the more health enhancing requirements for the high and moderate physically active levels as identified on the IPAQ. In London and Middlesex County 64.5% (± 2.8%) of adults is currently meeting this health enhancing level.

One other approach to considering how well we are doing is to compare the population of London and Middlesex County to a peer health unit. The region served by Ottawa Public Health is considered one of MLHU's Ontario peers in terms of many socio-economic factors. RRFSS Data is also available on physical activity levels using IPAQ during the same twelve-month time period. In Ottawa Region 32.1% (± 2.7%) of the adult population overall was physically active as compared to 42.0% (± 2.9%) in London and Middlesex County and an additional 24.3% (± 2.5%) as compared to 22.5% (± 2.5) in London and Middlesex County was moderately active. Therefore, London and Middlesex County have a significantly higher percentage of the population that reported a high or moderate level of physical activity as compared to the Ottawa Region. However there seems to be no significant difference in the percentage that is inactive in the Ottawa Region (18.8% ± 2.3) as compared to London and Middlesex (16.3% ± 2.2%). The balance of the difference lies in a greater percentage of those in the low level of physical activity in the Ottawa Region (24.8% ± 2.5) as compared to London and Middlesex County (19.2% ± 2.3).

SUMMARY AND PROGRAM IMPLICATIONS

A physically active lifestyle has long been considered an essential component of wellbeing. Overall, the results that have been achieved on the population level in London and Middlesex County to date are promising. Leisure-time physical activity levels indicate that the proportion of the population that is physically active has significantly increased from 2000/01 to 2003. Current total physical activity levels meet or exceed population level targets that have recently been set and a greater percentage of adults in London and Middlesex County are active as compared to our peer region of Ottawa.
Despite these encouraging results the community must be encouraged to continue to maintain these levels as the population ages and strive to be a model community in terms of both strategies to sustain physical activity levels and actual physical activity rates. Furthermore the Health Unit and its community partners must continue to be a resource and provide leadership to other sectors as the community as a whole strives to increase physical activity for the purposes of health and wellbeing.

Specific attention should be paid to tailoring programs by gender and age group. The identified differences in the physical activity level patterns by gender and by age group indicate that the factors related to being active may differ for men and women and that strategies may also need to be customized and gender specific. For example the pattern for males and females may reflect underlying family responsibilities that limit physical activity levels in many younger females during their child-rearing years.

Physical activity differs overall significantly by age group and a significant change point in activity level occurs from the 45-54 year old age group with decreasing percentages that are active in the 55-64 year old age group and older age groups. This change must be considered when promoting healthy aging within the population. Encouraging seniors to have physically active lives is important for

them to maintain their independence, to prevent or limit chronic diseases and to prevent injuries.

More subtle differences were observed by income and education groups. Communities with the help of Active 2010 need to continue to reduce barriers to participation in sport and physical activity for those families with lower incomes. No significant differences were found by place of residence (City of London or Middlesex County).

Initiatives may also want to consider effective measures to shift those individuals that are currently at a moderate or low level of physical activity into higher levels of physical activity. Public health aims to have the greatest percentage of people possible in those categories that would provide the best health benefits (high and moderate physically active levels). Yet, public health may best be able to influence those individuals in the combined levels of moderately physical activity (22.5% $\pm$ 2.5%) and low physical activity (19.2 $\pm$ 2.3%) which amounts to almost 42% of adults in London and Middlesex County. For many of the community level interventions aimed at encouraging adults to be more healthy, this is the group that one would most like to influence to be more active or at least to continue at their current activity levels over their life-span and thus benefit through the reduction of chronic diseases by leading a physical active lifestyle.

Despite strong health promotion efforts over the past three decades, many in London and Middlesex County continue to be at a low physically active or inactive levels that are not optimal for maintaining a healthy lifestyle. Ongoing monitoring, with the aim to understand the underlying influences that encourage individuals to stay active, is essential to develop effective public health interventions. Follow-up should be done to consider the workplace and the impact of types of employment on the overall total activity levels. Curiously, Ottawa Region is not significantly different from London and Middlesex County on leisure-time physical activity levels, but it is significantly lower on total physical activity. It may be possible that some of these differences are due to workplace differences.

This report provides a brief overview of the physical activity levels for the adult residents aged 18 and older of the City of London and Middlesex County. It is helpful as a base-line description against which future gains can be evaluated. Monitoring plans currently include the collection of three years of RRFSS data (2004, 2005, and 2006) on physical activity levels that will allow some tracking of local impacts of current physical activity programming in our community. Local programming will benefit from continued analysis and interpretation of these trends measured against these baseline results.

METHODS

DATA SOURCE

All data are from the Rapid Risk Factor Surveillance System (RRFSS) and are collected for the MLHU by the Institute of Social Research, at York University. Data were collected in a series of waves of monthly telephone surveys. Households were selected randomly from all households with telephones in London & Middlesex and respondents aged 18 and older were systematically selected from within each household for the adult that had the next birthday. Once an individual was identified as the person with the next birthday, every effort was made to complete the interview with the appropriate respondent. Although on average five calls were made to a single household, in order to complete the interview with the designated respondent, up to 14 call attempts was standard practice. Response rate was over 60% of eligible households. Questions related to respondent's recall of activities in the week prior to the survey (Physical Activity Module) were incorporated into RRFSS in January 2003 and MLHU began collecting data using this module in January 2004 (Wave 37). The unweighted sample for questions related to physical activity was 1,204 respondents from London and Middlesex surveyed from January 13, 2004

through to January 9, 2005. The sample used to calculate those with multiple risk factors was limited to the first eight waves of data (Waves 37-44) due to the fact that the series of questions on fruit and vegetable consumption was only included on the survey in 2004 for the first eight waves. Only those respondents from the first eight waves in 2004 that provided answers to all three modules (Physical Activity, Body Mass Index and Fruit and Vegetable Consumption) were included for a total of 682 eligible respondents.

ANALYSIS APPROACH

Given that this survey is a random household survey, weights were applied to approximate a random individual survey. Those individuals that did not respond to any individual question in the International Physical Activity Questionnaire (IPAQ) were excluded prior to calculating levels and percentages. Care was taken to include the physical activity module on RRFSS for the full year as the IPAC is a 7-day recall and one would expect to see seasonal variation in physical activity. It is assumed that by collecting for a full year any seasonal variation would be controlled.

The IPAQ has been validated with populations aged 15- 69 years old. [8] It has not yet been validated with older age groups however there are no foreseeable problems with using with older groups. RRFSS included all adult respondents in this module. Therefore despite the indicator suggested by the data dictionary on the RRFSS website (www.rrfss.ca) which suggested only adults aged 18-64 years old be included in the indicator, all adults ages 18 and older were used in this analysis. Activity levels were calculated using pre-coded syntax developed in August 2004. Since that time some modifications have been suggested in procedures for data truncation. Existing syntax truncates the maximum allowable minutes for all walking, moderate and vigorous time variables at 120. It has now been recommended to increase that truncation point so that all walking, moderate and vigorous time variables exceeding 240 minutes are truncated. However, the IPAQ Scientific Group identifies that this new rule needs further testing. This analysis did not implement this suggested modification. The effect of increasing the truncation level to 240 minutes is to increase the high active category and decrease the moderate active category. For example for London and Middlesex County the total percentage of adults in the high active category would increase from the current 40.4% to 42.2% and the moderate active category would decrease from 22.0 to 20.3%. Therefore the percentage reported in the higher activity categories might be considered conservative estimates.

All weighted percentages were provided with 95% confidence intervals. Bar charts include error bars illustrating 95% confidence intervals. Differences in percentages were considered significant at $p<0.05$. Results were considered unstable and subject to suppression if any of the following conditions existed: denominator of a rate was less than 30, numerator was less than 5 or coefficient of variation was greater than 33.3.

Where applicable, rates were analyzed by gender, age group, education level, income, and residence (City of London or County of Middlesex). Readers are referred to the RRFSS website at www.rrfss.ca. for a full itemizing of the questions in the physical activity module.

DEFINITIONS

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE -SHORT FORM (IPAQ)

- A series of questions that assess physical activity across a comprehensive set of domains including leisure time, domestic and gardening activities, work-related and transport-related activity. The respondent is asked to recall physical activity levels in the past 7 days.

Table 4: IPAQ Physical Activity Levels

Categorical Indicator	Description	Equivalent to:	Risk Level
High Physical Activity	• At least 7 days of any combination of walking, moderate-intensity or vigorous intensity activities achieving at least 3000 MET minutes per week **OR** • 3+ vigorous days and 3000 MET minutes per week	10,000+ steps per day	Low Risk Considered a health enhancing physical activity (HEPA) active category).
Moderate Physical Activity	At least: • 7 days of activity and 1500 MET minutes per week OR • 3 or more days of vigorous activity and 1500 MET minutes per week	Approx. 5,000 – 9,000 steps per day	At reduced risk Considered a health enhancing physical activity (HEPA) active category).
Low Physical Activity Considered Minimally Active	At least: • 3 to 6 days of vigorous physical activity of at least 20 minutes per day • 5 to 6 days of moderate physical activity or walking of at least 30 minutes per day • 5 days of any combination of activities per week and achieving a 600 MET-min/week	Approx. 2,000 – 4,999 steps per day	At some risk
Inactive Considered Inactive	• no activity is reported or less than minimal public health physical activity levels	<2,000 steps per day	At significantly higher risk

LEISURE TIME PHYSICAL ACTIVITY

In the Canadian Community Health Survey (CCHS), the level (or amount) of physical activity was defined based on total accumulated energy expenditure, or EE during leisure time. Information about energy expenditure at work (or during domestic chores) was not available. The EE values were calculated using the both the frequency and duration of all the respondents' leisure-time activities in the previous three months as well as the MET values of these activities. EE= N x D x MET value) /365 (to convert to daily data), where N= the number of times a respondent engaged in an activity in a year D= the average duration in hours of the activity MET value= the energy costs of the activity expressed as kilocalories expended per kilogram of body weight per hour of activity/ 365

MET values, which are the metabolic energy demand of each activity, were independently established. The frequency (or regularity) of physical activity was based on the number of times in the previous three months that respondents had participated in a physical activity that lasted more than 15 minutes. Three levels of leisure time physical activity were calculated as follows:

Active: ≥ 3.0
Moderate: ≥ 1.5 and < 3.0
Inactive: $\geq$) and <1.5

Metabolic Equivalent (MET)

A MET is a measure of physical activity intensity. It is the ratio of energy expended in kilocalories, divided by the resting energy expenditure in kilocalories. One MET is defined as the energy expenditure for sitting quietly, which, for the average adult, approximates 3.5 ml of oxygen uptake per kilogram of body weight per minute (1.2 kcal/min for a 70-kg individual). For example, a 2-MET activity requires two
times the metabolic energy expenditure of sitting quietly.

PEER GROUP

A grouping of health units that have similar social and economic characteristics. The Ontario Health Region Peer Groupings were developed by Statistics Canada on behalf of Hamilton Public Health and is available at http://hamilton.ca/phcs/Research/Docs/OntarioPublicHealthUnitPeerGroups(2003).pdf
Other health units in the same health region peer groupings as Middlesex-London Health Unit include: Ottawa Region, Hamilton Region, Windsor-Essex and Elgin St-Thomas.

PERSON-YEARS

An approach where each person contributes only as many years as they are actually observed. Example: if a person is in the study for only 2 years but moved from inactive to moderately active they would be 1 case per 2 person years.

REFERENCES

1. Bouchard, C., Shepard R.J., & Stephens T. (Eds.). (1994). *Physical activity, fitness, and health: International proceedings and consensus statement.* Champaign: Human Kinetics Publishers.

2. Chen, J. & Millar W.J. (2003). Starting and sustaining physical activity. *Health Reports,* 12(4).

3. Ontario Ministry of Health and Long Term Care (1997). *Mandatory Health Programs and Services Guidelines*. Toronto, ON: Queen's Printer for Ontario.

4. Canadian Cancer Society and Cancer Care Ontario (2003, May 1). *Targeting Cancer- an action plan for cancer prevention and detection. Cancer 2020 Background Report.* Retrieved August 23,2005 from http://www.cancercare.on.ca/pdf/Cancer2020BackgroundReportMay2003.pdf

5. Public Health Agency of Canada and the Canadian Society for Exercise Physiology (n.d.) Canadian Physical Activity Guide to Healthy Active Living. Retrieved August 26, 2005 from: http://www.phac-aspc.gc.ca/pau-uap/paguide/

6. Ontario Ministry of Health and Long Term Care (2004) *Chief Medical Officer of Health Report, Healthy Weights, Healthy Lives.* Toronto: Queen's Printer for Ontario.
Retrieved August 26, 2005 from:
http://www.health.gov.on.ca/english/public/pub/ministry_reports/cmoh04_report/healthy_weights_112404.pdf

7. Ontario Ministry of Health Promotion (2005 Aug.) *Active 2010- Ontario's Sport and Physical Activity Strategy, Ministry of Health Promotion*. Retrieved August 20, 2005 from: http://www.active2010.ca/Documents/active2010-strategy-e.pdf

8. *Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) - Short Form, Version 2.0.* (2004, April) Retrieved August 22, 2005 from: http://www.ipaq.ki.se/dloads/Scoring%20short%20April04.pdf

9. Middlesex-London Health Unit (2003) *Cardiovascular Disease Risk Factors: A Community Health Status Report for Middlesex-London* . London: Author.

10. Southwest Region Health Status Working Group. (2004). *Health Behaviours and Lifestyle Practices in Southwestern Ontario: Results from the Canadian Community Health Survey (2000/01).* London: Southwest Region Health Information Partnership.

CONTACTS

Author:

Ruth Sanderson, Health Unit Epidemiologist

Contact:

Ruth Sanderson, Health Unit Epidemiologist
Research, Education, Evaluation and Development (REED) Services
Middlesex-London Health Unit
50 King Street
London, Ontario
N6A 5L7
Phone: 5190663-5317 ext. 2481
Email: ruth.sanderson@mlhu.on.ca

This report is also available at: www.healthunit.com.

The author is grateful to:

- Mary Lou Albanese, Manager Chronic Disease and Injury Prevention and Bernadette Garrity, Public Health Nurse, Chronic Disease and Injury Prevention for there assistance in the conceptualization of this report and their review of the contents.
- Bernie Lueske, Data Analyst, for analyzing the data and providing data quality checks.
- Charlene Beynon, Director REED Services for her review of the report.

The author also gratefully acknowledges:

- Nancy Forbes, Administrative Assistant, REED Services, for her work on the layout and printing of the document.
- Amira Ali, Epidemiologist, Ottawa Public Health Unit for agreeing to allow us to include their rates in our report and clarifying some methods issues.
- Janet Phillips, Health Information Analyst, Toronto Public Health for creating the syntax to calculate physical activity categories and clarify yet more methods issues.