

A B S T R A C T

Objective: To examine the relationship between time since immigration and excess body weight.

Methods: Secondary data analysis of a cross-sectional survey of 19,600 Canadians.

Results: The prevalence of excess weight (BMI>25) increases with time since immigration for both men and women. After controlling for birthplace, socio-demographic, lifestyle and health correlates, only female immigrants (less than five years) are significantly less likely to have BMI scores greater than 25 kg/m² compared to those born in Canada. Stratified analyses, however, revealed similar findings for Asian men who had immigrated less than five years prior to the survey.

Discussion: Our results suggest that length of time since immigration is an important risk factor for excess weight. Further research with longitudinal data, more reliable measures of ethnicity, and anthropometric measures of weight are required to confirm these initial findings.

A B R É G É

Objectif : Examiner les rapports entre le temps écoulé depuis l'immigration et l'excès de poids.

Méthodes : Analyse secondaire de données issues d'une enquête transversale portant sur 19 600 Canadiens.

Résultats : La prévalence de l'excès de poids (IMC>25) augmente avec le temps écoulé depuis l'immigration, tant chez les hommes que chez les femmes. Après neutralisation des variables corrélées avec le lieu de naissance, la situation socio-démographique, le style de vie et la santé, seules les immigrantes (depuis moins de cinq ans) ont une probabilité nettement moindre d'avoir des résultats pour l'IMC supérieurs à 25 kg/m² en comparaison avec les personnes nées au Canada. Toutefois, les analyses stratifiées ont fait apparaître des résultats analogues pour les hommes asiatiques qui avaient immigré moins de cinq ans avant l'enquête.

Discussion : Les résultats laissent penser que la durée écoulée depuis l'immigration est un important facteur de risque d'excès de poids. D'autres recherches avec des données longitudinales, des mesures plus fiables de l'ethnicité et des mesures anthropométriques du poids sont nécessaires pour confirmer ces premiers résultats.

Time Since Immigration and Excess Body Weight

John Cairney, MA,¹ Truls Østbye, MD, MPH²

Excess body weight is a risk factor for a variety of health conditions and mortality making it a significant public health concern.¹⁻⁸ Epidemiological research from several different countries has shown obesity to be correlated with a variety of sociodemographic indicators,⁹⁻¹⁹ and sociocultural variables like ethnicity.^{20,21} In Canada, for example, the prevalence of obesity is lower among those of Asian and African descent while individuals of European origin have the highest overall prevalence.^{15,20}

Ethnic status is not the only way in which ethnicity may be related to weight. Research has also documented a tendency toward weight gain among some immigrants as they assimilate into new cultures.²¹ This is especially true for immigrants who relocate to countries where the prevalence of overweight and obesity is high relative to their country of origin. A high prevalence of excess body weight in the population suggests that the dominant dietary and lifestyle practices (e.g., high fat contents in diet and sedentary lifestyles) may not be conducive to maintaining normal weight. The acculturation hypothesis posits that as new immigrants assimilate into such a culture, they acquire, in addition to other cultural practices, the dietary and lifestyle habits of the dominant group. The greater the degree of acculturation, the greater the risk of weight gain.

Measures of acculturation, however, are indirect (e.g., based upon language spoken in the home) and often fail to capture the

temporal dimension involved in assimilating into a new culture. This paper examines whether the length of time since immigration is a significant independent predictor of excess weight among immigrants to Canada.

METHODS

Sample

The 1994 National Population Health Survey sampled 19,600 households across Canada using a multi-stage, stratified, random sampling procedure. Excluded from this sample were Native reserves, military bases, institutions, and some remote areas of Ontario and Quebec. For a complete description of the methodology of this survey, please consult reference 22.

Measures

Self-reported body weight and height were used to calculate the body mass index (BMI). This was the only measure of weight available in this survey. Although the cut-points selected to define overweight and obesity in the literature vary somewhat, for consistency with previous Canadian studies, excess weight was defined as a BMI score of greater than 25.¹⁵⁻¹⁷ The BMI is associated with an overestimation of obesity, and is less related to increasing health risks in the elderly. Therefore, those under 20 and above the age of 64 years were excluded.²³ Pregnant women were also excluded leaving a total sample of N=12,318. After a listwise deletion of cases with missing values, the sample was reduced to 11,818. This reduced sample, however, remained comparable to the original sample in terms of age, sex and marital status.

Length of time since immigration was a derived, ordinal level variable created by

1. Centre for Health and Well-Being, Department of Sociology, University of Western Ontario

2. Departments of Epidemiology & Biostatistics and Family Medicine, University of Western Ontario

Correspondence: John Cairney, Department of Sociology, University of Western Ontario, London, Ontario, E-mail: jcairney@julian.uwo.ca

Statistics Canada. Three indicator variables were created based upon the four categories: zero to four years, five to nine years, and ten or more years. The reference category was born in Canada. A categorical variable was constructed by Statistics Canada to represent five categories of birthplace: born in Canada (reference category), the US or Mexico, South America or Africa, Europe or Australia, and Asia.

Demographic, lifestyle and morbidity variables were included as covariates in multivariate analyses. Age (in 10-year intervals from 20 to 29 years (reference category) except for those aged 60 to 64 years), marital status (single, divorced, separated/widowed, married (reference)), educational attainment (less than high school (reference), high school, post secondary education), occupation (professional (reference), skilled, semi-skilled, unskilled, not working), alcohol consumption ("current", "former" (reference), "never"), smoking ("current", "former", "never" (reference)), level of physical activity (based upon an estimate of the kilocalories expended per week: active, moderate, sedentary (reference)). Finally, seven self-reported health conditions were included: diabetes, heart disease, hypertension, arthritis, stroke, stomach problems and respiratory problems.

Statistical analysis

Statistical analyses were conducted using SAS (Release 6.08), SAS Institute Inc., Cary NC, USA. Variables were entered in stages to assess the effect of time since immigration on overweight and obesity after controlling for major covariates. Coefficients under Model 1 (see Tables II and III) show the unadjusted effect of each of the indicator variables for time since immigration on excess weight. Model 2 adds adjustments for birthplace, a proxy measure for ethnicity, to assess whether or not the relationship between time since immigration and excess weight is due to particular ethnic groups. Models 3, 4 and 5 add adjustments for demographic, lifestyle and health variables which may confound the relationship between immigration and weight. Only Odds Ratios and p-values are reported. Regression analyses were also conducted with BMI as a contin-

TABLE I
Prevalence of Excess Weight (BMI>25) and Mean BMI Scores Among Immigrants Compared to Those Born in Canada for Both Males and Females (N=11,818)

Time Since Immigration	Total Number of Men	Prevalence of Excess Weight (weighted data)	Mean BMI Score	Total Number of Women	Prevalence of Excess Weight (weighted data)	Mean BMI Score
0 to 4 years	71	33.5%	23.3 (3.7)	86	17.1%	22.7 (3.6)
5 to 9 years	92	44.2%	25.1 (3.8)	107	31.0%	23.6 (4.3)
10 or more years	559	52.6% ^a	25.8 ^c (3.6)	618	42.1% ^e	24.8 ^g (4.3)
Born in Canada	4886	59.3% ^b	26.2 ^d (3.6)	5399	37.4% ^f	24.9 ^h (4.6)
Total	5608			6210		

a Difference in prevalence estimates between immigrant groups only, Chi square 18.86, 2df, p<0.01
b Difference in prevalence estimates including Canadian-born group, Chi square 57.27, 3df, p<0.01
c Difference in mean BMI scores between immigrant groups only, F=13.87, 2df, p<0.01
d Difference in mean BMI scores including Canadian-born group, F=19.55, 3df, p<0.01
e Difference in prevalence estimates between immigrant groups only, Chi square 37.99, 2df, p<0.01
f Difference in prevalence estimates including Canadian-born group, Chi square 25.61, 3df, p<0.01
g Difference in mean BMI scores between immigrant groups only, F=10.68, 2df, p<0.01
h Difference in mean BMI scores including Canadian-born group, F=9.30, 3df, p<0.01

uous measure, as well as logistic regressions with obesity (BMI>27) and overweight (25>BMI>27) separately. The results of these analyses are consistent with the findings reported. Therefore, we only report the findings for excess weight (BMI>25).

RESULTS

The prevalence of excess weight is quite high for Canadian-born men and women (Table I). Excess weight increases with the length of time since immigration for both sexes. In fact, among women, those who immigrated ten or more years ago have a higher prevalence of excess weight compared to those born in Canada. Mean BMI scores show a generally similar pattern with the exception of the last category (10 or more years).

Initial analyses revealed a significant interaction between gender and time since immigration. Since men are, on average, heavier and have a higher prevalence of obesity than women,^{15,16} and the etiological mechanism for obesity may be somewhat different, we conducted separate analyses for men and women. Table II reports the results of the analyses for men only. Although time since immigration was found to be significantly related to excess weight in men at the bivariate level, after

controlling for birthplace, the effect was reduced to non-significance (Model 2). The only birthplace variable significantly related to excess weight was for those of Asian origin. This suggests the possibility that the effect of time since immigration observed in Model 1 may be due to the fact that Asian immigrants are less likely to be overweight than others.

The results were different for women (see Table III). Those who had been in Canada for four years or less were significantly less likely to have BMI scores greater than 25 kg/m² than individuals born in Canada. Moreover, this relationship persisted after controlling for place of birth, demographic and lifestyle factors and health conditions which may also affect weight. The analysis also showed that immigrants who had been in Canada for ten or more years were more likely to be overweight or obese than those born in this country. However, this effect was reduced to insignificance in model 4, suggesting that the relationship could be accounted for by smoking and physical activity. Consistent with the analyses for men, those who were born in Asian countries were less likely to have BMI scores greater than 25 kg/m².

Further analyses (not shown) revealed that the average BMI scores of Asian

TABLE II
Logistic Regression of Overweight and Obesity (BMI>25) onto Time Since Immigration, Place of Birth, Demographic, Lifestyle and Morbidity for Men Aged 20 to 64 in the 1994 National Population Health Survey (N=5,608)

Variables	Model 1 ORs	Model 2 ORs	Model 3 ORs	Model 4 ORs	Model 5 ORs
Time Since Immigration					
0 to 4 yrs	0.39 ***	0.78	0.79	0.82	0.84
5 to 9 yrs	0.58 ***	0.99	1.08	1.13	1.17
10 or more yrs	0.75 ***	1.05	0.92	0.94	0.99
Born in Canada	1.00	1.00	1.00	1.00	1.00
Birthplace					
US/Mexico		0.96	1.06	1.04	0.95
South America / Africa		0.78	0.80	0.78	0.75
Europe / Australia		0.97	0.87	0.84	0.80
Asia		0.25 ***	0.27 ***	0.28 ***	0.27 ***
Born in Canada		1.00	1.00	1.00	1.00
Age					
20 to 29 yrs			1.00	1.00	1.00
30 to 39 yrs			1.42 ***	1.41 ***	1.37 ***
40 to 49 yrs			1.42 ***	1.41 ***	1.37 ***
50 to 59 yrs			1.26 ***	1.22 *	1.10
60 to 64 yrs			0.78	0.74 *	0.73 *
Marital Status					
Single			0.66 ***	0.66 ***	0.67 ***
Divorced /Separated/ Widowed			0.73 **	0.74 **	0.74 **
Married			1.00	1.00	1.00
Education					
Less than High School			1.00	1.00	1.00
High School			0.82 *	0.79 **	0.80 **
Post Secondary			0.82 *	0.79 **	0.80 **
Occupation					
Professional			1.00	1.00	1.00
Skilled			1.03	1.07	1.06
Semi-skilled			0.81 *	0.84 *	0.85
Unskilled			1.03	1.08	1.06
Not working			0.88	0.94	0.90
Smoking					
Current				0.83 **	0.83 **
Former				1.21 **	1.20 **
Never				1.00	1.00
Alcohol Consumption					
Current				1.13	1.15
Former				1.00	1.00
Never				0.69 *	0.71 *
Physical Activity					
Active				1.05	1.05
Moderate				0.96	0.95
Sedentary				1.00	1.00
Health Conditions					
Diabetes					1.30
Heart Disease					1.19
High Blood Pressure					2.67 ***
Arthritis					1.16
Stroke					0.46
Stomach Problems					1.38
Respiratory Problems					0.77

ORs=Odds Ratios

*** p<0.001, ** p<0.01, * p<0.05

immigrants were significantly lower than those of immigrants from other countries and of those people born in Canada. Since this group appears to differ significantly from the rest, the adjustment in the multivariate model may not be powerful enough to control for differences between ethnic groups. Stratified analyses both excluding Asian immigrants and including only respondents from this group were conducted (see Table IV). Since country of birth,

at least among men, has such a powerful influence on weight, we have excluded Canadian-born subjects from the analyses shown in Table IV. The reference category is immigrants who have been in the country for ten or more years. The results for men suggest that time since immigration is only a significant factor in predicting excess weight among Asian males. Asian men who have been in Canada for less than five years prior to the survey were sig-

nificantly less likely to have BMI scores greater than 25 kg/m² after adjusting for a variety of possible confounding factors. Interestingly, however, Asian men who have been in Canada for five to nine years were more likely to report excess weight than Asian males who have been in Canada for ten or more years. For women, the effect of time since immigration is essentially the same for both Asian immigrants and those from other countries. It is important to note that there were not enough cases of Asian immigrants in either sample of men or women to test the full model including health conditions (Model 5). However, a separate model adjusting for health conditions did not affect the results presented in Table IV.

DISCUSSION

Time since immigration is an important correlate of overweight and obesity for women regardless of ethnic origin, and for men of Asian origin. Moreover, this effect is not due to differences in weight attributable to other demographic, lifestyle and health factors which are also significantly related to body mass. Since we have (at least partially) controlled for level of physical activity, the effect may be due to increasing overall caloric intake or increasing proportion of calories from fat.²⁴ However, since exercise is notoriously hard to measure, our indicator of physical activity may not be an adequate measure of energy expenditure. It will be important in subsequent work to replicate our findings using both measures to assess the relative contribution of each factor. Our results also suggest that in order to better understand the acculturation process, we must pay attention not only to indicators like language spoken in the home, but also to length of time since immigration. As well, gender and country of birth (a proxy for ethnic origin) appear to moderate the impact of time since immigration on weight. Further research should consider how the effect of acculturation on weight may vary by time, gender and ethnic origin. Finally, subsequent work must also examine the discrepant finding observed among Asian men. It is unclear why immigrants in the five to nine year category would be

more likely to report excess weight than those in the ten or more year group.

Despite the intriguing implications of this research, there are several important limitations with these data which need to be addressed in future research. First, this study is cross sectional and therefore it is not possible to assess whether individuals are gaining weight the longer they live in Canada. For example, differences may be attributable to cohort effects. Longitudinal data are required to confirm the findings reported. Second, although we have controlled for birthplace, the measures available for analysis in this public use data set were limited. Asia, for example, is a large heterogeneous geographical area, as are South America and Africa. Some immigrants have also lived in several different countries prior to immigration to Canada, thus lessening the importance of birthplace as the only measure of cultural origin. More precise measures of ethnic origin are desirable to ensure that time since immigration is not confounded with other factors such as cultural practices. Finally, although it has been found that self-reported height and weight are reasonably accurate, such data have been found to underestimate BMI when compared to actual measurements, especially in obese women.^{16,24} If so, then our estimates may actually underestimate the relationship between time since immigration and overweight and obesity. Adjustments to self-reported BMI have been suggested.²⁵ However, these adjustments appear arbitrary and are not based on a Canadian population. A replication of this study with measured anthropometric data could confirm the accuracy of our findings.

It is encouraging that recent female immigrants are less likely to be overweight and obese than those born in Canada. The challenge for public health is to encourage these women not to gain excess weight. Educational programs targeted to new immigrants on the health risks of being overweight may provide one such mechanism to achieve this goal.

ACKNOWLEDGEMENTS

Financial support for this research was provided to John Cairney by a

TABLE III
Logistic Regression of Overweight and Obesity (BMI>25) onto Time Since Immigration, Place of Birth, Demographic, Lifestyle and Morbidity for Women Aged 20 to 64 in the 1994 National Population Health Survey (N=6,210)

Variables	Model 1 ORs	Model 2 ORs	Model 3 ORs	Model 4 ORs	Model 5 ORs
Time Since Immigration					
0 to 4 yrs	0.36 ***	0.53 *	0.51 **	0.45 **	0.53 *
5 to 9 yrs	0.78	1.26	1.46	1.28	1.35
10 or more yrs	1.23 **	1.84 *	1.72 *	1.57	1.57
Born in Canada	1.00	1.00	1.00	1.00	1.00
Birthplace					
US/Mexico		0.60	0.65	0.72	0.76
South America / Africa		0.92	0.91	0.88	0.90
Europe / Australia		0.75	0.69	0.77	0.76
Asia		0.39 ***	0.39 ***	0.37 ***	0.36 ***
Born in Canada		1.00	1.00	1.00	1.00
Age					
20 to 29 yrs			1.00	1.00	1.00
30 to 39 yrs			1.06	1.05	1.02
40 to 49 yrs			1.62 ***	1.60 ***	1.48 ***
50 to 59 yrs			1.36 ***	1.32 ***	1.15
60 to 64 yrs			1.03	1.01	0.92
Marital Status					
Single			0.83 *	0.86 *	0.85 *
Divorced / Separated / Widowed			1.02	1.08	1.01
Married			1.00	1.00	1.00
Education					
Less than High School			1.00	1.00	1.00
High School			0.84 *	0.83 **	0.83 *
Post Secondary			0.68 ** *	0.68 ** *	0.68 ** *
Occupation					
Professional			1.00	1.00	1.00
Skilled			1.02	1.01	1.09
Semi-skilled			1.38 ***	1.40 ***	1.36 **
Unskilled			1.23 **	1.23 **	1.13
Not working			0.88	0.94	0.90
Smoking					
Current				0.83 **	0.81 **
Former				1.19 *	1.15 *
Never				1.00	1.00
Alcohol Consumption					
Current				0.84 *	0.90
Former				1.00	1.00
Never				1.00	1.04
Physical Activity					
Active				0.64 ***	0.65 ***
Moderate				0.91	0.91
Sedentary				1.00	1.00
Health Conditions					
Diabetes					2.84 ***
Heart Disease					0.91
High Blood Pressure					2.81 ***
Arthritis					1.70 ***
Stroke					2.15
Stomach Problems					0.96
Respiratory Problems					1.49 **

ORs=Odds Ratios

*** p<0.001, ** p<0.01, * p<0.05

Fellowship from the Social Science and Humanities Research Council of Canada. Financial assistance was also provided by the Centre for Health and Well Being and the University of Western Ontario.

REFERENCES

- Negri E, Pagano R, Decarli A, et al. Body weight and the prevalence of chronic diseases. *J Epidemiol Commun Health* 1988;42:24-29.
- Kannel WB, Cupples LA, Ramaswami R, et al. Regional obesity and risk of cardiovascular disease: The Framingham Study. *J Clin Epidemiol* 1991;44:183-90.
- Manninen P, Riihimaki H, Heliovaara M, et al. Overweight, gender and knee osteoarthritis. *Int J Obesity* 1996;20:595-97.
- Kuskowska-Wolk A, Rossner S. Obesity and self-perceived health in Sweden. *Int J Obesity* 1996;20:369-72.
- Ferraro KF, Yan Y. Body weight and self-ratings of health. *J Health Soc Behav* 1995;36:274-84.
- Stoll BA. Obesity and breast cancer. *Int J Obesity* 1996;20:389-92.
- Hunter DJ, Willett WC. Diet, body size, and breast cancer. *Epidemiol Rev* 1993;15:110-32.

TABLE IV
Odds Ratios from the Logistic Regression of Excess Weight (BMI>25) on Time Since Immigration in Four Samples (Asian Immigrants Analyzed Separately)†

Variables	Men Only		Women Only		Men Only		Women Only	
	Without Asian Immigrants	Only Asian Immigrants						
	N	ORs	N	ORs	N	ORs	N	ORs
Time Since Immigration								
0 to 4 yrs	35	1.28	36	0.24 **	47	0.53 *	39	0.09 ***
5 to 9 yrs	58	0.86	34	2.81 *	62	0.91	45	0.46
10 or more yrs	470	1.00	89	1.00	517	1.00	101	1.00

† All models control for age, marital status, education, occupation and lifestyle variables. Models without Asian immigrants also control for birthplace and the health condition variables.

ORs=Odds Ratios

*** p<0.001, ** p<0.01. * p<0.05

8. Lee IM, Manson JE, Hennekens CH, Paffenberger RS. Body weight and mortality: A 27 year follow-up of middle-aged men. *JAMA* 1993;270:2823-28.
9. Laurier D, Guiguet M, Chau NP, et al. Prevalence of obesity: A comparative survey in France, the United Kingdom and the United States. *Int J Obesity* 1992;16:565-72.
10. Pietinen P, Variatnen E, Mannisto S. Trends in body mass index and obesity among adults in Finland from 1972 to 1992. *Int J Obesity* 1996;20:114-20.
11. Lissner L, Bengtsson C, Lapidus L, et al. Smoking initiation and cessation in relation to body fat distribution based on data from study of Swedish women. *Am J Public Health* 1992;82:273-75.
12. Al-Nuaim AR, Al-Rubeaan K, Al-Marzou Y, et al. High prevalence of overweight and obesity in Saudi Arabia. *Int J Obesity* 1996;20:547-52.
13. Gutierrez-Fisac JL, Regidor E, Rodriguez C. Trends in obesity differences by educational level in Spain. *J Clin Epidemiol* 1996;49:351-54.
14. Rosmund R, Lapidus L, Bjorntorp P. The influence of occupational and social factors on obesity and body fat distribution in middle-aged men. *Int J Obesity* 1996;20:599-607.
15. Ostbye T, Pomerleau J, Speechley M, et al. Correlates of Body Mass Index in the 1990 Ontario Health Survey. *CMAJ* 1995;152(11):1811-17.
16. Cairney J, Wade TJ. Correlates of body weight in the 1994 National Population Health Survey. *Int J Obesity* 1998;22(6):584-91.
17. Macdonald SM, Reeder BA, Chen Y, Despres JP. Obesity in Canada: A descriptive analysis. *CMAJ* 1997;157(suppl.):S3-S9.
18. Sobal J, Stunkard AJ. Socioeconomic status and obesity: A review of the literature. *Psychol Bull* 1989;105:260-75.
19. Stunkard AJ. *Obesity*. Philadelphia: Saunders, 1980.
20. Pomerleau J, Ostbye T. Le lien entre le lieu de naissance et certaines caractéristiques de santé en Ontario. *Can J Public Health* 1997;88(5):337-45.
21. Acculturation, socioeconomic status, and obesity in Mexican Americans, Cuban Americans and Puerto Ricans. *Int J Obesity* 1997;21:91-96.
22. Statistics Canada. National Population Health Survey. Public Use Microdata File User Documentation. Ottawa, 1996.
23. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Report of a WHO study group. *WHO Technical Reports Series* 1990;797:203.
24. Rowland ML. Self-reported weight and height. *Am J Clin Nutr* 1990;52:1125-33.
25. Kuskowska-Wolk A, Kausson P, Stolt M, Rossner S. The predictive validity of body mass index based on self-reported weight and height. *Int J Obesity* 1989;13:441-53.

Received: May 13, 1998

Accepted: November 6, 1998

Directives de rédaction à l'intention des auteurs

La *Revue canadienne de santé publique* publie des articles originaux sur la santé publique, la médecine préventive et la promotion de la santé. Les articles sont évalués par des pairs. Tous les manuscrits soumis pour publication dans ses colonnes doivent respecter les Directives de rédaction à l'intention des auteurs qui se trouvent aux pages 8-9 du numéro de janvier/février 1999 (Vol. 90, No. 1) de la *Revue canadienne de santé publique* avant de présenter un manuscrit.

Les documents à publier doivent être soumis au rédacteur en chef scientifique de la *Revue canadienne de santé publique*, 1565 avenue Carling, bureau 400 à Ottawa, Ontario (Canada) K1Z 8R1.

Le Comité de rédaction de la *RCSP* a adopté une politique de révision des articles, par des pairs, en double aveugle. Auteurs et réviseurs restent anonymes.

La Rédaction doit recevoir l'original et deux copies (pour la révision par des pairs), ainsi qu'une disquette. Afin d'assurer l'anonymat de cette révision par des pairs, les auteurs doivent s'assurer de ne donner les renseignements les identifiant que sur la page titre de l'original seulement; la page titre des deux copies à l'intention des réviseurs ne doit avoir que le titre.

Le manuscrit doit être dactylographié à double interligne d'un seul côté de feuillet de 8½ po. par 11 po. Prévoir également une marge d'au moins 1¼ po. autour du texte. Si le texte existe sur

une machine à traitement de texte, nous demandons la soumission d'une disquette format Macintosh 3½ po.

Les articles originaux ne doivent pas dépasser **2 000 mots**. Les brefs comptes-rendus, qui auront la priorité pour publication, ne doivent pas dépasser **800 mots**; il n'est pas nécessaire de fournir un abrégé pour un bref compte-rendu. Veuillez indiquer le nombre de mots.

La page titre de l'original doit comporter : 1) le titre et un bref sous-titre de 40 caractères au maximum; 2) les noms et prénoms des auteurs; 3) leurs diplômes d'études; 4) le nom du service ou de l'organisme dans le cadre duquel le travail a été effectué; 5) les organismes auxquels les auteurs sont affiliés, autres que ceux cités en 4); 6) le nom, l'adresse, le numéro de téléphone et l'adresse électronique de l'auteur chargé des accords de publication du manuscrit; 7) une renonciation aux droits, le cas échéant; 8) le nom et l'adresse de l'auteur à qui les demandes de réimpression doivent être envoyées; et 9) les divers types d'assistance, notamment les subventions, le matériel et les médicaments.

Les documents sont acceptés en anglais ou en français. La page deux doit comporter un bref résumé du texte, pas plus de **150 mots**, écrit dans la même langue que l'article. *Il est également nécessaire de fournir une traduction professionnelle de l'abrégé.*

Nous vous encourageons à écrire à la Rédaction, en vous priant d'envoyer des lettres aussi courtes que possible.

La Rédaction se réserve le droit de modifier les articles.