A Brown Paper:
The Health of South Asians in the United States

The Brown Paper is a groundbreaking compendium and review of health research and literature on South Asians in the United States. Published in 2002, the Brown Paper evaluates and summarizes existing knowledge about key health indicators for South Asian Americans. For a full, print copy of the Brown Paper, please e-mail info@sapha.org. Electronic versions of individual chapters are available online at http://www.sapha.org/pages.php?id=42.
Introduction: South Asian Dietary Practices

South Asians who live in the United States have significant within-group diversity in dietary intake and practice based on their country of origin. Furthermore, regional differences in dietary intake and practices exist within each South Asian country. Thus, when examining diet and nutrition of South Asians to assess their health risks, it is important to determine country and region of origin.

Geographic and climactic variations and a heterogeneous population within each country make South Asian dietary practices unique and diverse. For example, dietary patterns differ among individuals of northern, southern, eastern, and western parts of India. Additionally, a vast majority of the South Asian population is vegetarian for reasons, such as cost, culture, and religion. While individuals from all regions may share similarities with respect to certain foods, such as fruits and vegetables, certain marked distinctions exist in patterns of consumption (see Table 1).

Regional differences in diet are also found among older Asian Indian immigrants in the US. For example, immigrants from the northern states of India more frequently consume dark breads,

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eggs, and fats; and immigrants from the southern states of India more frequently consume starchy foods and fried chicken. Specific dietary practices may increase health risks for individuals from a particular region of South Asia. Patterns of food consumption contribute to differences not only in nutrient intake but also in body mass index (BMI), chronic disease risk factors, such as blood cholesterol and blood sugar, and overall health status.

South Asian Immigrants and Dietary Intake: Summary of Current Research Findings
Much of the research related to dietary intake among South Asians has been conducted in the 1980s and 1990s in the United Kingdom (UK) and the US, focusing on subgroups of the South Asian population. Generally, existing studies provide an initial overview of the dietary patterns in the Western world. However, it is important to note that majority of the studies have mainly examined first generation Asian Indian adult immigrants. Specific findings of nutrition-related research are highlighted (see Table 2).

McKeigue et al. observed that South Asian immigrants consume diets low in fat, (<30% energy), with a high ration of polyunsaturated to saturated fat. However, given the high prevalence of cardiovascular disease (CVD) in this population, it is likely that the 30% dietary fat recommendation may be in excess of actual needs for this group. Yagalla et al. examined a group of immigrant Asian Indian physicians, with a mean age of 47 years and mean length of residence in the US of 19 years. The average dietary energy intake was 56% carbohydrates, 32% fat, and 8% saturated fat. These individuals tended to consume

### Table 1. Examples of Dietary Intake Practices by Selected Regions of South Asia

<table>
<thead>
<tr>
<th>Country &amp; Region</th>
<th>Dietary Intake Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>India (North)</td>
<td>Main staple is wheat</td>
</tr>
<tr>
<td></td>
<td>Higher consumption of dried or pickled fruits, vegetables, eggs</td>
</tr>
<tr>
<td></td>
<td>Common beverage tea</td>
</tr>
<tr>
<td>India (South)</td>
<td>Main staple is rice</td>
</tr>
<tr>
<td></td>
<td>Higher consumption of fresh fruits and vegetables</td>
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<tr>
<td></td>
<td>Common beverage coffee</td>
</tr>
<tr>
<td>(East)</td>
<td>Seafood commonly consumed even by vegetarians</td>
</tr>
<tr>
<td></td>
<td>Main staple is rice</td>
</tr>
<tr>
<td></td>
<td>Milk based dishes is common</td>
</tr>
<tr>
<td>(West)</td>
<td>Predominantly vegetarian based diet</td>
</tr>
<tr>
<td></td>
<td>Seafood popular among coastal regions</td>
</tr>
<tr>
<td></td>
<td>Main staple is wheat</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Indian and Arabic cooking practices</td>
</tr>
<tr>
<td></td>
<td>Halal meats</td>
</tr>
<tr>
<td></td>
<td>Flat breads and pilafs common</td>
</tr>
<tr>
<td></td>
<td>Main staples are wheat, rice and corn</td>
</tr>
<tr>
<td></td>
<td>Common beverage team</td>
</tr>
<tr>
<td></td>
<td>Alcohol forbidden</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Seafood commonly consumed</td>
</tr>
<tr>
<td></td>
<td>Halal meat</td>
</tr>
<tr>
<td></td>
<td>Alcohol forbidden</td>
</tr>
<tr>
<td>Nepal</td>
<td>Main staples are rice, legumes, pulses</td>
</tr>
</tbody>
</table>

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large evening meals consisted of traditional South Asian foods.

BMI, a ratio of weight (kg) to height (m) squared, is a widely recognized risk factor for poor health and is influenced by an individual’s dietary and lifestyle practices. Yagalla et al. also found that among vegetarians BMI was higher than that of non-vegetarian participants (26 vs. 24.4). The vegetarian diets were rich in high fat dairy products, resulting in total fat and saturated fat intake similar to that of non-vegetarians. In addition, only 30% of these individuals exercised 60 minutes per week, potentially contributing to the high BMIs.

Raj et al. reviewed the dietary practice of Asian Indian adults living in the New York and Washington, DC areas, based on length of stay in the US. Of the respondents, 63% preferred mostly Indian foods, 31% preferred traditional and non-traditional food equally, and 6% preferred one or the other exclusively. Interestingly, long-time residents (living in the US for greater than 10 years) reported consumption of mostly traditional foods for dinner and weekend meals. Since immigrating to the US, these participants reported consuming fewer traditional mixed dishes (based on cereals, legumes, and/or vegetables) and consuming more fruit juice, chips, fruits, margarine, cola, and alcoholic beverages. Additionally, self-reported data suggests that these individuals had elevated cholesterol levels, hypertension, arthritis, and diabetes, were over-weight.

Another study conducted by Kamath et al. examined the CVD risk factors in a group of premenopausal South Asian females living in the US. About 38% of the women reported having a vegetarian diet, and 81% reported consuming a variety of ethnic foods in addition to total cholesterol (TC), triglycerides (TG), low density lipoprotein cholesterol (LDL-C), and lipoprotein(a), (Lp(a)) were higher, and high density lipoprotein cholesterol (HDL-C) was lower. These are well-established risk factors of CVD in the general population and are influenced by an individual’s dietary and lifestyle practices.

Kamath et al. also observed a group of middle-aged Asian Indian men, living in the US for approximately 17 years, and found that 24% were overweight. Of the total male respondents, 82% were non-vegetarians and dietary fat contributed 36% of calories, carbohydrates contributed 49% of calories and protein contributed 14% of calories. Although dietary cholesterol intake was within the recommended range (162 mg/day), 19% had elevated TC (>6.2 mmol/L) and 46% had borderline TC (5.2-6.2 mmol/L). Of these men, 4% reported having heart disease or angina, 1.6% had suffered a heart attack, 15% had hypertension, and 8.8% had diabetes. Data here show that is necessary to give attention to dietary intake in order to properly assess health risks.

It is necessary to avoid assumptions based on the dietary practices in the country of origin when addressing nutrition and health. Once individuals have immigrated to the US, they need to become aware about food choices and nutritional contents of the various ethnic and non-ethnic foods that are available. Evidence suggests that dietary recommendations to prevent chronic

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disease in the general population may need to be adapted and modified to the dietary practices of the South Asian immigrants. On the other hand, there may be benefits in South Asian dietary practices as well. Death rates associated with cancer have been observed to be low and may be attributed to the high fiber, high beta-carotene intake and/or variations in colonic metabolites of South Asians, requiring a closer look at diet and nutritional content of various foods and gaining a better understanding of predisposition to chronic disease.

Earlier US-based studies indicate that altering vegetarian status and meal patterns, changing frequency in consumption of traditional Asian Indian foods, and increasing use of Western foods commonly occur among Asian Indians upon migration to the US. Similarly, South Asians in the United Kingdom (UK) were less likely to consume confectionery, biscuits, cakes, and desserts than the general British population. They were also more likely to consume fresh fruit and vegetables, salads, whole wheat flour, soft drinks, and fruit juices. Only 16% of South Asians reported never eating meat. However, compared with the general British population, South Asians were more likely to eat mat three times a week, especially poultry and fish. As in previous studies, individual body fat was more centrally located, and they were shorter. These changes in dietary practices may further aggravate the potential genetic predisposition of certain groups to chronic disease conditions.

In addition the well-established chronic disease conditions, South Asians may also be susceptible to other diet-related conditions, namely lactose intolerance, osteoporosis, and iron-deficiency anemia, which can influence their overall health and functional well-being. Lactose intolerance refers to symptoms associated with the digestive system, such as diarrhea, gas, bloating, and abdominal pain, arising from the consumption of lactose, the principal sugar in dairy product. The intolerance develops due to a decline in the activity or absence of lactase, the enzyme needed for the digestion of milk sugar. Typically, this decline in enzyme activity is believed to be a normal physiologic response of aging. However, certain ethnic groups are known to be more susceptible to lactose intolerance than others, and prevalence of the disorder varies widely among different ethnic and racial groups.

In the US, it is estimated that 90% of Asian Americans exhibit lactose mal-digestion. However, it is unclear what percent of this population is comprised of South Asians, and the prevalence of the condition in South Asians is not well established. Individuals who believe they are lactose intolerant typically decrease their intake of dairy products, negatively affecting the amount of micronutrients, such as calcium and vitamin D, which are provided by these products. It is,

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therefore, important to accurately diagnose the condition and provide appropriate treatment, which can include the use of lactose-free milk and lactose-digestive aids.

<p>| Table 2. Summary of Studies Examining Dietary Intakes of South Asian Immigrants* |
|---------------------------------|---------------------------------|---------------------------------|</p>
<table>
<thead>
<tr>
<th>Reference</th>
<th>Study of Population</th>
<th>Participants</th>
<th>Results of Dietary Intakes</th>
</tr>
</thead>
</table>
| Gupta14 | US | Asian Indian men and women, 20-45 years of age (n=50) | 60% ↑ non-vegetarian dietary habits  
American foods eaten for breakfast and lunch  
80% preferred typical Indian dinner  
50% started consuming alcoholic beverages |
| Sevak et al.15 | UK | South Asian men, 40-69 years of age (n=173) | Nutrient intake: 46% energy from carbohydrates, 14% energy from protein, 36% energy from fat.  
High dietary fiber intake  
47% did not consume alcohol |
| Yagalla et al.5 | US | Asian Indian men, 29-75 years of age (n=153) | 84% non-vegetarians  
Nutrient intake: 56% energy from carbohydrates, 13% energy from protein, 32% energy from fat  
American foods consumed for breakfast and lunch  
Indian food typically consumed for evening meals  
Vegetarian diet was higher in carbohydrate and high-fat diary products. |
| Kamath et al.7 | US | Asian Indian men, 26-76 years of age (N=187) | 82% non-vegetarians  
Nutrient intake: 49% energy from carbohydrate, 14% energy from protein, 36% energy from fat  
36% had elevated cholesterol levels |
| Kamath et al.6 | US | Asian Indian and Pakistani women, 19.8-38.7 years of age (n=47) | 38% vegetarians  
19% followed an “all Indian/Pakistani” diet  
53% followed an “all American diet”  
Median Nutrient intake: 58% energy from carbohydrates, 13% energy from protein, 30% energy from fat, 12 g fiber/day  
↑ blood cholesterol levels in South Asian women vs. American women |
| Raj et al.16 | US | Asian Indian men and women, 20 years of age or older (n=73) | 60% non-vegetarians  
63% mostly preferred Indian foods  
↓ intake of traditional mixed dishes  
↑ intake of fruit juices, chips, fruit, margarine, cola and alcoholic beverages |

Table

<table>
<thead>
<tr>
<th>Author(s) and Study Details</th>
<th>Country</th>
<th>Study Population</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lawson and Thomas&lt;sup&gt;17&lt;/sup&gt;</td>
<td>UK</td>
<td>South Asian children, 2 years of age Bangladeshi (n = 139); Pakistani (n=200); Asian Indian (n=279)</td>
<td>20-34% of South Asian children had blood vitamin D levels indicative of deficiency. 20-29% of South Asian children had low hemoglobin levels indicative of iron deficiency.</td>
</tr>
<tr>
<td>Fischbacher et al.&lt;sup&gt;18&lt;/sup&gt;</td>
<td>UK</td>
<td>South Asian men and women, 25-74 years of age Asian Indian (n=259); Pakistani (n=305); Bangladeshi (n=12)</td>
<td>32% of Asian Indians rarely or never ate meat vs. 2% of other ethnic groups. Anemia due to iron deficiency was 3 times more common in South Asian women.</td>
</tr>
<tr>
<td>Chambers at al.&lt;sup&gt;19&lt;/sup&gt;</td>
<td>UK</td>
<td>Asian Indian males, mean age 52 years (n=518)</td>
<td>Low blood levels of vitamin B12 and folate.</td>
</tr>
</tbody>
</table>

*This is not an exhaustive list of the published literature; the intention of this table is to provide an overview of some of the existing literature; ↑ = increased; ↓ = decreased

In the US, it is estimated that 90% of Asian Americans exhibit lactose mal-digestion. However, it is unclear what percent of this population is comprised of South Asians, and the prevalence of the condition in South Asians is not well established. Individuals who believe they are lactose intolerant typically decrease their intake of diary products, negatively affecting the amount of micronutrients, such as calcium and vitamin D, which are provided by these products. It is, therefore, important to accurately diagnose the condition and provide appropriate treatment, which can include the use of lactose-free milk and lactose-digestive aids.

Osteoporosis and iron-deficiency anemia are chronic conditions also known to be related to diet (see Women’s Health chapter). Briefly, osteoporosis is a degenerative bone disease that occurs as a result of lower bone mineral density in Asian women and men, mainly attributed to smaller body frame size, smaller skeleton size, lower body weight, as well as lower intake of foods rich in calcium and vitamin D, such as diary products. Cundy et al., observed that bone mineral density in Asian Indian women were significantly lower at all sites compared with European women. Dietary deficiencies in calcium intake may begin early in life due to decreased milk consumption. Mal-absorption of calcium can result from deficiencies of vitamin D due to either inadequate diet or decreased exposure to sun-light as a result of cultural norms. Social dogma that prevents the use of hormone replacement therapy by post-menopausal women can

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undermine potential options in treatment of osteoporosis. Certain socio-cultural factors also explain the higher prevalence of osteoporosis among Asians.

In addition to correcting diet for prevention of osteoporosis, there is a need to increase iron consumption, particularly among women. The vegetarian diet ahhs been implicated in several nutrient deficiencies, contributed to iron-deficiency anemia and influencing individual functional well-being. These and other diet related practices increase the risk for chronic disease among South Asians.

Dietary practices can play a significant role in susceptibility to disease, and a better understanding of these practices is needed in order to improve overall health for South Asians. However, given the diversity within South Asian groups, it is imperative that future studies be conducted with a more representative sample of the population. Data should in inclusive of and needs to compare age, gender, length of residence in the US, as well as country and region of origin.

Addressing the Gap in Nutritional Guidelines for South Asians Foods

While dietary guidelines are recommendations are targeted for the general population, there is a clear need for assessing nutritional content of South Asian foods. A few groups, such as the American Dietetic Association (ADA), United States Department of Agriculture (USDA), and the Indian American Dietetic Association (IADA), have attempted to address this gap and increase knowledge of dietary requirements.

The Food Guide Pyramid: A Guide to Daily Food Choices provides a translation of traditional South Asian foods into the USDA recommendations. It provides guidelines with respect to the appropriateness of foods within the major USDA food groups and their relative serving sizes. Similarly, the Food Guide Pyramid with Popular Indian Fare by the ADA is helpful in translating the USDA Food Guide Pyramid guidelines into specific ethnic Indian foods. These are useful tools for South Asians who are following a more traditional diet. As part of the Nutrition Education for New Americans Project of the Department of Anthropology and Geography at Georgia State University, the USDA Food Guide Pyramid has been translated into several South Asian languages (e.g., Hindi, Gujarati, Bengali) to educate target groups about the positive and negative consequences of Western foods. Guidelines include nutritional information for pregnant women and their growing infants.
The ADA has also created a document called the “Ethnic and Regional Practices: A Series: Indian and Pakistani Food Practices, Customs and Holidays.” It provides dieticians working with South Asian clients useful information regarding traditional foods, health beliefs, food practices by region and religion, and contemporary food habits. The prevalence of diabetes among South Asians is addressed, including dietary recommendations for individuals living with diabetes. Recommendations also are interpreted and translated for nutrition management of diabetes, as they apply to the typical food habits of individuals maintaining a traditional South Asian diet and who have Type 2 (non-insulin dependent) diabetes. Sample meals and a brief chart with nutrient content of traditional foods are listed.²⁸

Founded in 1992, the IADA is comprised of volunteer dietitians, working with South Asian communities. They provide medical nutrition therapy to senior citizens, work with physicians to provide dietary counseling for South Asians, organize community health expos to increase nutrition awareness, and deliver nutrition and health-related lectures in various South Asian languages. Familiar with the community’s dietary habits, the IADA serves as a resource for nutritional counseling.²⁹

**Recommendations**

This review on nutrition and South Asians highlights the complex dietary practices and behaviors of the community as well as the need for in-depth examination of the dietary and nutrient food content. Further studies are needed to identify ways to improve the dietary behaviors and lower risk of morbidity and mortality from chronic diseases. Based on the review, the following recommendations are made:

- Improve overall dietary intake and closely examine nutritional make up of foods.
- Provide nutrition education with regards to making healthful dietary choices in both traditional and non-traditional foods.
- Adapt and translate current dietary recommendations for South Asian populations.
- Examine the influence of socio-cultural factors on dietary practices and on health status.
- Research dietary and nutrient intake for greater understanding and increased efficacy of chronic disease prevention and treatment messages.
- Develop and test nutrition education and intervention tailored to community needs.
- Educate dietitians and health care professionals about South Asian dietary practices in order to increase the effectiveness of their prevention and treatment messages.

²⁸ Nutrition Education for New Americans Project of the Department of Anthropology and Geography at Georgia State University, Atlanta, GA. Available at: [http://monarch.gsu.edu/nutrition/download.htm](http://monarch.gsu.edu/nutrition/download.htm).
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