



# Literature Review: Costs of Not Providing Interpretation in Health Care

## EXECUTIVE SUMMARY

Access to good quality health care is one of the fundamental principles of our Canadian health care system. Yet, there is a small but growing body of research that highlight that Canadians who are not proficient in Canada's two official languages experience major health inequities as a result of language barriers. Although addressing health inequities must be considered an ethical and legal obligation, the perceived cost of providing interpretation services represents a major health systems-level challenge. As a result, there are serious shortcomings in both the availability and quality of interpretation services within the healthcare system in Canada.

The focus of this paper is on making a 'business case' for the implementation of professional and coordinated interpretation services in Canadian health care as a basis for, as described by Tang (1999), providing all Canadians their right to an acceptable standard of health care, regardless of race, class, gender and cultural/linguistic background.

To this end, a network of healthcare professional, under the auspices of Access Alliance, commissioned a literature and environmental scan to document the role and impact of interpretation services within healthcare system. The databases used for the literature search included Pub Med/Medline and Psycinfo for the years 1997-2009. The environmental scan identified 'grey literature' using professional contacts, websites (e.g., National Council on Interpreting in Health Care, Speaking Together, Hablamos Juntos) and a request to the 'SDOH' (social determinants of health) listserv.

Findings from the literature review and the environmental scan suggest that the provision of professional interpretation services not just contributes to overcoming linguistic barriers in

healthcare for both service users and providers but is central to providing 'high quality' health care that is accessible, equitable, timely, safe, and patient centered. The review also found evidence that professional interpretation services can cut overall institutional costs in the long run and improve efficiency, and thus makes business sense as well. The literature review found strong international evidence of the negative impacts of language barriers not just on clients but also on providers and healthcare institutions in terms health care accessibility, quality, efficiency and cost. Existing research findings indicate that lack of professional interpretation services within healthcare further undermined the accessibility and quality of health care as well as undercutting efficiency and increasing overall institutional costs.

The absolute costs of failing to address language barriers were not always well-documented; in fact absolute cost-benefit analysis is difficult to undertake when many of the socio-economic benefits or costs in terms of quality, equity and wellbeing are intangible and hard to quantify. Nonetheless, **findings from existing literature highlight that that the numerous benefits that patients, providers and healthcare institutions receive from professional interpretation services outweigh the costs of implementing such services. More importantly, there was a general consensus in the literature that the provision of language access services within healthcare should not be viewed as a separate 'add-on' program, but as an essential component of a strategy to meet broader organizational goals including managing risk, improving quality of care, reducing health disparities, and establishing partnerships with marginalized communities.** More research is needed on the cost benefit of providing interpreter services, the effectiveness and costs of different types and models of interpreter services, and the identification of strategies to reduce racialized and ethnic health disparities.

This literature review was commissioned by Access Alliance Multicultural Health and Community Services to document the costs of not providing interpretation services in order to make an evidence-based business case for more interpretation funding, and for a professionally integrated and coordinated model of interpretation services. This initiative was led by Axelle Janczur (Access Alliance), Linda Gardner (Women's College Hospital), Elba de Leon (St. Joseph's Health Centre), Elizabeth Abraham (University Health Network), Pat McKernan, Samer Abou-Sweid (St. Michael's Hospital) Bonnie Fleming-Carroll (Hospital for Sick Children), Fei Tang (Toronto Rehabilitation Institute) and Matthew Adams. Access Alliance hired Dr Ilene Hyman to conduct the literature review. This literature review report is written by Dr Hyman, and reviewed and published by Access Alliance in June 2009.



The environmental scan of existing professional interpretation service models suggest that better coordination and integration of interpretation services can substantially reduce institutional costs of implementing these services while enhancing service quality, efficiency and consistency. The scan results also indicate that language access services appear to be most efficient and cost effective when organized at a regional (rather than facility) level.

Based on the findings from this literature review and the environmental scan we recommend:

1. Increased funding to expand and integrate professional interpretation services within Canadian healthcare system as a strategy for not just overcoming linguistic barriers but for promoting accessible, equitable and high quality healthcare services to all Canadians regardless of ethnicity, race, class, gender and linguistic/cultural background.
2. Establish government funding formulae for the reimbursement of health care institutions that provide interpreter services
3. Provide training for health professional in the use of interpretation services
4. Develop and pilot a centralized model of service provision to improve consistency and quality of interpretation services and reduce costs.

## INTRODUCTION

Access to good quality health care is one of the fundamental principles of our Canadian health care system. Yet many Canadians who are not proficient in Canada's two official languages experience major health inequities as a result of language barriers. Addressing health inequities must be considered an ethical and legal obligation. In the United States, Title VI of the Civil Rights Act protects against discrimination based on national origin by obligating medical institutions to provide interpretation and translation services (Perkins, 2003) and in California, the Health Care Language Assistance Act (to be implemented in 2009), will require health plans and health insurers to provide interpreter services & translated materials. However the perceived cost of providing interpretation services represents a major health systems-level challenge and the lack of consensus over financing in the U.S and Canada has resulted in wide gaps in both the quality and availability of interpretation services (Ku and Flores, 2005).

The focus of this paper is on making a 'business case' for the implementation of professional interpretation systems in health care, as a basis for, as described by Tang (1999) providing all Canadians the right to an acceptable standard of health care, regardless of race, class, gender and cultural/linguistic background. This position is consistent with the recent Conference Board of Canada report (2008) suggesting that

taking action on the Social Determinants of Health (including immigrant's access to the health care system) will have a positive impact on the health of Canadians as well as on business performance and profits.

This literature review supports and advances the argument that suggest that the provision of professional interpretation services not just contributes to overcoming linguistic barriers in healthcare for both service users and providers but is central to providing 'high quality' health care that is accessible, equitable, timely, safe, and patient centered. The review also found evidence that professional interpretation services can cut overall institutional costs in the long run and improve efficiency, and thus makes business sense as well.

The paper begins with a review of the impacts of language barriers on health care quality, efficiency and cost. This is followed by a review of the literature on the benefits and costs of providing or not providing professional interpretation services. The paper concludes with recommendations for future research and for the implementation of professional interpreter services in health care (to complete).

## METHODS

The parameters for the literature review included the following:

1. Compile evidence that support the business case that not providing interpretation results in increased overall costs to the healthcare system.
2. Focus on hospitals and specialist care.
3. Focus on system costs (and not individual costs).
4. Search primarily Canadian and US literature (only 10% international).
5. Search recent literature (80% of literature should be from last five years i.e. 2003 onwards).
6. Focus on primarily peer-reviewed literature (include approx. 10% grey literature from well reputed sources that have used sound methodology).

The methodology for the literature review included both a literature search and an environmental scan. The databases used for the literature search included Pub Med/Medline and Psycinfo for the years 1997-2009. The main (primary) search was conducted using the following keywords: interpreters AND cost/cost analysis (N=35) and language barriers AND cost/cost analysis (N = 219).

Three secondary searches were conducted. The first used the following keywords, language barriers AND health care efficiency (N = 8), language barriers AND safety (N = 37), language barriers AND adverse events (N = 9), language barriers AND hospital admission/utilisation (N = 19), language barriers AND physician time (N = 79), language barriers AND timeliness



(N = 5), language barriers AND health equity (N = 12), language barriers AND quality of care (N = 279), language barriers AND patient satisfaction (N = 111). The second used the following keywords, interpreters AND health care efficiency (N = 3), interpreters AND safety (N = 9), interpreters AND adverse events (N = 0), interpreters AND hospital admission/utilisation (N = 11), interpreters AND physician time (N = 35), interpreters AND timeliness (N = 3), interpreters AND health equity (N = 3), interpreters AND quality of care (N = 82), interpreters AND patient satisfaction (N = 51). The third search used the keywords language barriers OR interpreters AND Canada (N = 17). Other peer-reviewed articles were identified using the related links and citations function in PubMed. Only articles that were relevant to the parameters of this review were included. There was substantial overlap with the literature on ethnic/racial disparities.

The literature review also identified recent several review articles citing additional peer-reviewed journal articles identified through their own systematic searches of PubMed, Psycinfo, and Sociological abstracts (Goode et al., 2006; Bowen, 2004; Jacobs et al., 2006; Jacobs et al., 2003; Karliner et al., 2005).

- Two review articles specifically examined the business case for providing linguistically appropriate services (Bowen, 2004; Goode et al., 2006).
- One review article examined 'benefits' of using trained/professional interpreters (Karliner et al., 2005).
- One review article on language interpreter utilization in the **emergency department** (Ramirez et al., 2008)
- One review article examined cost effectiveness of remote (video and phone) interpretation (telephone and video) (Azarmina & Wallace, 2005).
- One review article was on the impact of interpreters on the quality of health care (and patient satisfaction) (Flores, 2005).
- A systematic review of the best evidence to determine the effectiveness and costs of interventions to improve health care quality for racial/ethnic minorities 1980 – 2003 (Beach et al., 2006).

The environmental scan was conducted to identify grey literature such as government and institutional reports and demonstration projects. The scan also included interviews with relevant healthcare providers and administrators across Canada to document existing models of professional interpretation services. It included the use of professional contacts, a search of relevant websites (e.g., National Council on Interpreting in Health Care; Speaking Together, Hablamos Juntos) and requests for information from SDOH listserv.

## FINDINGS

### 1. Language Barriers and Health Care Impacts

This section examines and updates the literature on the impacts of language barriers on health care quality, efficiency and cost. For the purposes of this review health care 'quality' is defined according to the Massachusetts General Hospital Guide for Hospital Leaders in terms of effectiveness, safety, timeliness, patient centeredness, accessibility, and equity (MGH, 2008).

Efficiency is considered to be necessary for a high performing health care system but compared to 'quality of care', there has been less consensus regarding its definition and measurement. For example, health care administrators, consumers and providers all have different perspectives on what constitutes health care efficiency and appropriate cost.

Efficiency is usually measured by examining the relationship between a specific product of the health care system (output) and the resources used to create that product (inputs). Health service outputs can be measured in a variety of ways, for example, individual units of service (e.g., procedures, prescriptions); bundles of services within a single entity [e.g., hospital length of stay (LOS)] bundles of related services provided by one or more entities (e.g., episodes of care). A provider in the health care system (e.g., hospital, physician) would be efficient if it was able to maximize output for a given set of inputs or to minimize inputs used to produce a given output (Agency for Healthcare Research and Quality, 2006).

***It is recognized that the lines between health care quality, and efficiency and cost are sometimes blurred, as for example in the case of non-compliance with treatment which directly impacts on health care efficiency and cost. This paper examines the impacts of language barriers on 'quality of care' and 'health care efficiency and cost' separately as the former are central to making the 'quality case' and the latter are central making to the 'business case'.***

#### 1.1 Quality of Care

Quality of care is examined in terms of effectiveness, safety, timeliness, patient centeredness and equity:

**Effectiveness** – All patients should receive care that uses evidence-based guidelines to determine whether an intervention (preventive service, diagnostic test, etc.) produces better outcomes. Included in this principle is the integration of research evidence with clinical expertise (skills to identify each patient's unique health state and diagnosis, individual risks and benefits of interventions, and personal values and expectations) and patient values (unique preferences brought by each patient to the clinical encounter and must be integrated into clinical decisions)(MGH, 2008).

Several studies indicated that patients with language barriers were less likely than patients without language barriers to receive effective, evidence based treatments (Smedley et al., 2002).



Communication difficulties were associated with a wide range of outcomes including misdiagnosis, inappropriate treatment, and the inadequate use of medication such as analgesia for pain control (refs in John-Baptist and Bowen, 2004, Goldman, 2006). Language barriers were also associated with poor management of acute and chronic conditions (for example, gallstones, asthma, diabetes) (see Bowen, 2004; John-Baptiste et al., 2004; Goldman, 2006). It was well-documented that language barriers reduced the likelihood that patients would receive appropriate follow-up (see Divi et al., 2007; Jacobs et al., 2006). A notable study that examined 491 language concordant and 123 language discordant patients in an urban ED demonstrated that patients with language barriers (with or w/o interpreters) were less likely to receive follow-up appointments (Sarver and Baker, 2000; Ramirez, 2008).

**Safety** - Patients should not be harmed by the care that is intended to help them, and they should remain free from accidental injury, misdiagnosis and inappropriate treatment. Ensuring patient safety also requires that patients be informed and participate as fully as they wish and are able—and that patients and their families should not be excluded from learning about uncertainty, risks, and treatment choices (MGH, 2008).

**Effective communication is critical to the delivery of safe, high-quality care. Many studies suggested that language barriers limit the process of informed consent and contribute to preventable morbidity and mortality** (Divi et al., 2007; Cohen et al., 2005; Schyve, 2007; Bowen, 2004). As such, barriers in patient-provider communication are a common root cause of adverse events in health care (Schyve, 2007). This is discussed in more detail under 'Adverse Events' in Section 1.2.

Risk management considerations and the potential for or actual litigation provided strong arguments for addressing language barriers as well as the implementation of professional interpretation services (Perkins, 2003). As described by Goode et al. (2006), providers may be liable for damages as a result of treatment in the absence of informed consent and the failure to convey treatment instructions accurately may raise the presumption of negligence on the part of providers. Several costly cases were documented that bore this out. While less common in Canada, some malpractice suits have occurred because of a failure to address language barriers. As documented in Bowen (2004), the B.C. Supreme Court found a physician negligent and awarded a patient 1.3 million dollars because of misdiagnosis resulting in the amputation of a limb, language factors were identified as a contributing factors in the death of a pregnant Vietnamese women, the issue of the interpreters role in obtaining consent was raised in the case of pediatric cardiac deaths in Manitoba. The risk of medical malpractice is reduced when competent medical interpretation is provided and should be taken into account because the costs of malpractice are high when an adverse event occurs (Goode et al., 2006).

**Timeliness** - Patients should not experience harmful delays in receiving necessary services, and waiting times should constantly be reduced (MGH, 2008). There was ample evidence to suggest that patients with language barriers received less timely care. Adult patients experienced longer waiting times to see a physician in the ED, delays in surgery and were less likely to receive renal transplantation than patients without language barriers (see MGH, 2008). Similar findings were reported for pediatric patients (Galbraith et al., 2008).

**Patient-Centeredness** – According to MGH (2008), the key dimensions of patient-centered care include respect for patient's values, preferences, and expressed needs; coordination and integration of care; information, communication, and education; physical comfort; emotional support; and involvement of family and friends.

***The bulk of the literature reviewed examined the impacts of language barriers on the dimensions of patient satisfaction, coordination of care and patient compliance. Language barriers were associated with lower patient satisfaction and lower patient compliance with treatment and appointments (see Bowen, 2004; Carter-Pokras, 2004; John-Baptiste, 2004; Flores et al., 2008; Ramirez et al., 2008).***

Although ethnic and linguistic disparities in patient satisfaction and compliance with physician care have been studied in several countries, this issue has not received significant attention in Canada. Liu et al. (2007) conducted a survey among Chinese and Whites in a Canadian city to determine their reported satisfaction, and perceptions of physicians. It is notable that within the Chinese study population, Chinese with limited English and recent Chinese immigrants were less satisfied than their Canadian born Chinese counterparts.

**Equity** - Studies are increasingly beginning to look at equity as a marker of good quality. Equity is achieved by providing care that does not vary in quality by personal characteristics such as linguistic proficiency, ethnicity, gender, geographic location, and socioeconomic status.

A large body of published research suggests that health disparities based on income, immigrant status, race and ethnicity persist, even after adjusting for variables such as age, gender, education level, and severity of disease. For example, racialized groups receive and perceive lower quality and intensity of health care compared to non-racialized groups across a wide range of health services (Washington et al., 2008; Blanchard & Lurie, 2004; Bhugra et al., 2004; Ngo-Metzer et al., 2004; Corbi-Smith et al., 2002; Smedley et al., 2003). For many racialized groups, language barriers strongly contribute to these differential experiences (Gonzales-Espada et al., 2006). Even in Canada where the body of literature on racial and ethnic disparities in quality of health care is relatively thin, there was ample support for effective communication as fundamental to the provision of



good quality health care (Oxman-Martinez & Hanley, 2005; Access Alliance Multicultural Health and Community Services, 2005; Whitley et al., 2006; Hrycak and Jacobec, 2006).

The literature search did not identify any articles that specifically examined the relationship between equity and linguistic proficiency.

### Summary

The literature reviewed suggests that language barriers have a significant impact on quality of health care in terms of effectiveness, safety, timeliness and patient centeredness. There is clearly a need for more research on equity.

## 1.2 Efficiency and Cost

The literature review identified several articles that examined the impact of language barriers on efficiency and cost. The latter were typically measured in terms of adverse events, inappropriate testing and procedures and hospital utilisation rates (e.g., admissions, length of stay in the ED or hospital, avoidable admissions). It is recognized that these outcomes may also affect the efficiency of the health care system and direct costs by contributing to waiting lists, service duplication, additional physician or health professional utilisation and less efficient use of staff time (Bowen, 2004). Fewer studies examined the direct impact of language barriers on financial outputs or efficiency inputs.

**Adverse Events – Language barriers can inhibit a clinician's ability to elicit patient symptoms, often resulting in diagnostic errors (Ku et al., 2005).** An adverse event is any 'unintended harm to the patient by an act of commission or omission rather than by the underlying disease or condition of the patient (Aspden et al., 2004). Although different classification systems are in use for adverse events these typically include missed or delayed diagnosis, medication errors and procedural mistakes.

Until recently few studies specifically examined the contribution of language barriers to adverse events because adverse events were typically underreported and information on language proficiency and interpreter availability was not routinely recorded in hospital information systems (Divi et al., 2007).

Building on earlier literature reviews (see Bowen, 2001), the literature review identified additional evidence that patients with language barriers experienced more medical errors and with greater clinical consequences than their language proficient counterparts (Divi et al., 2007; Schyve, 2007; Flores et al., 2003; Jacobs et al., 2006). This led the Joint Commission to conclude that communication problems are the most frequent cause of serious adverse events (Wilson-Stronks et al., 2007).

For example:

- Divi et al. (2007) used adverse event data from 6 U.S. hospitals over 7 months in 2005 to examine differences in the characteristics of adverse events between English speaking patients and patients with limited English proficiency. The study's most notable finding was that some degree of detectable physical harm occurred in 49.1% of reported adverse effects for patients with language barriers compared to 29.5% of patients who spoke English fluently. As expected, slightly more than half of the adverse events experienced by patients with language barriers were attributable to some failure in communication compared with 35.9% for English-speaking patients, however patients with language barriers also experienced more events attributable to questionable advice/interpretation, questionable disclosure and questionable assessment of patient needs (e.g., care or communication needs). These findings reinforce the importance of providing professional interpreter services for patient safety.
- Cohen et al. (2005) conducted a case-control study in a large academic pediatric hospital to determine whether pediatric patients whose families had language barriers experienced more adverse events than patients whose families did not have language barriers. Language barriers were self-defined as by self or by a provider-reported request for an interpreter. The majority of families with language barriers were Spanish-speaking. The study concluded that Spanish-speaking families who requested an interpreter experienced a two-fold increased risk for serious medical events compared to patients who had no language barrier or patients whose families spoke another language. The authors speculated that providers may not rely as much on interpreters for Spanish-speaking families because they erroneously believe that they are proficient in Spanish.
- Bartlett et al. (2008) randomly selected 20 large hospitals in the province of Quebec to examine whether communication problems were associated with adverse events. Of the 145,672 admissions to the selected hospitals they randomly selected 2,355 patient charts and abstracted patient characteristics. Of the 217 adverse events, 2.7% were judged to be preventable. Patients with preventable adverse events were 3 times more likely to have a communication problem.

**Inappropriate Testing and Procedures** – It has been suggested that language barriers are associated with an increased reliance on diagnostic tests for conditions that may otherwise have been diagnosed during history-taking (Elixhauser et al., 2002). The literature presented consistent findings that language barriers were frequently associated with unnecessary, hazardous, expensive tests and procedures (e.g., IV's, intubation, CT scans) as well as the omission of other indicated tests (Flores et al., 2002; Ku et al., 2005; Hampers and McNulty, 2002; Jacobs et al., 2006; Hampers et al., 1999).

To cite a few examples:

- Waxman & Levitt (2000) conducted a prospective comparative study in a hospital ED to examine whether



patients with language barriers had more diagnostic tests ordered than their English-speaking counterparts. The authors found that non-English speaking patients with abdominal pain had significantly more tests ordered, especially costly abdominal CT scanning. There were not significant differences in tests ordered for chest pain, probably because there are fewer diagnostic modalities available for this condition. The authors concluded that diagnostic testing is higher among patients with language barriers and may be higher for certain conditions than for others.

- Bard et al. (2004) conducted a 9-year retrospective review of the National Trauma Registry for the American College of Surgeons database to examine potentially preventable intubations among Spanish-speaking patients. They found that Spanish-speaking trauma patients were significantly more likely to be intubated than their English-speaking counterparts, suggesting that language and communication barriers led to potentially preventable intubations. This was also shown to be true for children presenting to the ED with asthma (see Goldman (2006).

**Hospital Utilisation Rates** – The majority of studies reviewed suggested that the presence of a language barrier was associated with more frequent hospital admissions (see Waxman and Levitt, 2000; Hampers and McNulty, 2002; Jacobs et al., 2006), although some studies detected no difference in hospital admission rates (Waxman & Levitt, 2000). It has also been suggested that risk of re-admission may be higher among patients with language barriers as they are more likely to misunderstand discharge instructions.

Another frequently used indicator to assess the efficiency of health care delivery is the length of the hospital visit. Previous literature reviews suggested that the presence of a language barrier was associated with longer stays in ED and hospital stays for many medical conditions (Bowen, 2001). This finding was confirmed by two recent Canadian studies.

- **John-Baptiste et al. (2004) used retrospective administrative data 1993-1999 from University Health Network, comprised of 3 Toronto tertiary care hospitals, to investigate the impact of language proficiency on length of stay and in-hospital mortality. After adjusting for comorbidity and Socio-economic status, findings suggested that patients with a language barrier stayed in hospital longer for 7 of 23 conditions (unstable coronary syndromes and chest pain, coronary artery bypass grafting, stroke, craniotomy procedures, diabetes mellitus, major intestinal and rectal procedures and elective hip replacement) and 6% (approx. .05 days) longer overall compared to patients without a language barrier.** There was no impact on in-hospital mortality. The study was not able to assess the use of interpreter services on study outcomes.
- Goldman et al. (2006) retrieved computerized records of all visits to the ED at the Hospital for Sick Children in Toronto for

1 year to determine if children whose parents spoke a primary language other than English (Chinese, Spanish, Tamil) experienced longer LOS compared to a random sample of English speaking families. After adjusting for other variables associated with LOS, non-English speakers had a significantly longer LOS in the ED. This difference was significantly pronounced for Tamil families who spent 18 minutes or longer than average.

The MGH (2008) report proposed that ‘addressing language barriers can expedite the discharge process, and thus decrease length-of-stay’. This issue takes on particular importance for hospitals that run at capacity, as they are often prevented from reliably scheduling high-revenue generating elective surgical procedures, and frequently need to go on emergency room diversion because of bed shortages.

**Several studies found that language barriers were associated with more emergency department visits (Carter-Pokras, 2004) and a lower likelihood of being given a FU appointment (Sarver & Baker, 2000; Bernstein et al., 2002).**

**Direct Costs** – Although adverse events, inappropriate tests and procedures and increased hospital utilisation undoubtedly translate into high financial costs for a health care institution, the literature review did not identify any recent articles that calculated the impact of language barriers in terms of financial costs.

A seminal study by Hampers et al. (1999) used a prospective cohort design to examine whether language barriers were associated with differences in rates of diagnostic testing and length of stay. Standard hospital charges were applied for each patient visit to a pediatric ED between September 1997 through December 1997. The authors found that the overall mean charge for tests was significantly higher for patients with a language barrier compared to those without (\$145 vs. \$104). Employing an analysis of variance model, the authors calculated that the presence of a language barrier accounted for a \$38 increase in charges for tests and a 20 minute longer ED stay. Since this study included some patients who used an interpreter in the language barrier group the results were likely underestimated (Hampers et al., 1999; Hampers & McNulty, 2002).

### Summary

The literature reviewed demonstrated that language barriers have a negative impact on efficiency contributing to diagnostic errors, adverse events, excessive or unnecessary tests, prolonged hospital stays and inappropriate use of the ED. All of these factors indirectly affect health care costs by contributing to waiting lists, service duplication, and additional physician visits, less efficient use of staff time, higher rates of hospitalization (Bowen, 2004). Few studies directly examined the direct costs of language barriers. Taken together these findings suggest that



addressing language barriers will improve the quality of care to patients, improve efficiency and will reduce health care costs, although the latter have not been quantified.

## 2. Benefits and Costs of Interpreters in Health Care

***This section examines and updates the literature on the benefits of providing professional interpreters on health care quality, efficiency and cost (as well as its converse i.e., the costs of not providing interpretation services).***

Among the studies identified were two recently completed systematic reviews of the impacts of interpreters on quality of care.

- Flores et al. (2005) focused their literature review on the impacts of interpreters on quality of care classified according to communication issues (e.g. quality, adequacy, type and errors), patient satisfaction (e.g. general and by type) and health care processes, outcomes, complications and health care utilisation (N = 36).
- Karliner et al. (2007) examined whether the use of professional interpreters improved clinical care in terms of communication (errors and comprehension), utilisation (e.g. ED visits, hospital admissions, number of diagnostic tests, preventive care), clinical outcomes and satisfaction (patient and provider). Whenever possible they compared professional vs ad hoc interpreter services, and interpreter services vs no available services (NB. articles did not always distinguish between professional and ad hoc) (N = 28).

Since our intent was to make a 'business case' for the provision of professional interpreter services in general, less attention was placed on documenting the effectiveness and costs of different types of interpretation services.

### 2.1 Health Care Quality

Most of the articles reviewed examined the benefits of providing professional interpreter services in terms of clinical effectiveness, safety and patient satisfaction.

***Effectiveness – Overall, the literature reviewed suggested that the use of professional interpreters in medical encounters significantly improved clinical outcomes, understandings of diagnosis and treatment, management of chronic diseases and patient compliance, and reduced disparities in utilisation of services, errors in communication and rates of surgical interventions (Karliner et al., 2007; Ku & Flores, 2005; Lee et al., 2002). In fact, many studies agreed that the use of professional interpreters raised quality of care received to approximate that received by English speaking patients (Flores, 2005; Karliner et al., 2007; Ku & Flores, 2005).***

An older but frequently cited example was Bernstein et al.'s

(2002) study of the impact of interpreter services on emergency department (ED) services in a large urban academic teaching hospital. Outcomes were compared among three groups of patients: an interpreted group (IP), consisting of all non-English speaking patients who received professional medical interpreter services; a non-interpreted group (NIP), consisting of all non-English speaking patients who did not receive interpreter services; and a comparison group, consisting of English-speaking patients (ESPs) from the same racial and ethnic background as the first two groups. The researchers found the ESPs stayed in the ED longer than did NIPs and received significantly greater intensity and volume of services than did either the IPs or NIPs. In fact, the NIP group ranked lowest in terms of tests/procedures received, duration of visit, amount of medication received and likelihood of having an IV started. These findings suggested that patients who did not have access to interpreters received poorer quality of care than their English-speaking counterparts, thus the provision of professional interpreters is essential to 'level the playing field'.

Flores (2005) further suggested that interpreter services can affect the quality of psychiatric encounters, highlighted the positive effects of bilingual providers, and the adverse impacts of ad hoc or no interpreters. With the exception of two older studies (Drennan, 1996; Stolk, 1998), no recent studies specifically examined the costs and benefits of professional interpreter services in the field of mental health.

**Safety** - Downing's (1991) study of the impact of using unprofessional interpreters (cited in Agger-Gupta, 2001) was one of the first studies to dramatically illustrate that the error rate of untrained interpreters (including family and friends) was sufficiently high to make their use more dangerous in some circumstances than no interpreter at all. Several more recent studies cited numerous problems associated with ad hoc interpreters, including issues of confidentiality and mistakes in interpretation such as false fluency, editorial comments, omissions, substitutions and additions (Flores et al., 2003). This work strongly suggests that patient safety is improved with the use of professional interpreters.

**Patient Centeredness** - Language and communication are critical to patient satisfaction and compliance. In an earlier study, Lee et al. (2002) reported that patients who used family members to interpret were less satisfied with the provider listening, discussion of sensitive issues, and manner than patients whose language was concordant with that of the provider. Garcia et al.'s (2004) study of the pediatric ED found that parents with hospital interpreters reported greater satisfaction than parents who had ad hoc or telephone interpreters. Green et al. (2005) found that assessments of communication and health care quality were identical among patients with language barriers that used interpreters and those whose clinicians spoke their language.



These findings were echoed in the review conducted by Flores (2005) who found that patients who had access to bilingual providers or professional interpreters reported the highest levels of satisfaction, equivalent to those reported by English proficient patients. The use of ad hoc interpreters resulted in significantly lower satisfaction and patients who needed but did not receive interpreters reported the lowest rates of satisfaction.

***The use of professional interpreters was also found to be associated with similar or better patient compliance in terms of adherence to medication and FU appointments (Flores, 2005; Ku and Flores, 2005; Carter-Pokras et al., 2004).***

### Summary

The literature reviewed suggests that the provision of professional interpreters improves the quality of health care received by patients with language barriers in terms of clinical effectiveness, safety and patient satisfaction. Reducing the likelihood of mis- or non-diagnosis and improving compliance also reduce health care costs.

## 2.2 Efficiency and Cost

This section reviews the evidence of the benefits of providing professional interpreter services in terms of adverse events, inappropriate testing, hospital utilisation rates (e.g. admissions, length of stay, use of the ED) and physician time. Again, these outcomes affect the efficiency of the health care system and direct costs (Bowen, 2004).

Cost-benefit analysis is the process of evaluating the expected costs in relation to benefits in order to determine if a program or service is worth doing (Bowen, 2004). Fewer studies examined efficiency inputs, physical (e.g., availability of interpreters, staff time) or financial (e.g. real or standardized dollars assigned to interpreter services) in relation to the direct financial cost of providing or not providing interpretation services.

**Adverse Events** – Several studies compared rates of medical errors and/or misdiagnoses among patients who were provided with ad hoc and professional interpreters. There was a general consensus in the literature that professional interpreters make fewer clinically significant errors than ad hoc interpreters (Flores et al., 2003; Flores, 2005) (NB. Differences between types not examined). Flores et al. (2005) also found that ad hoc interpreters misinterpreted or omitted up to half of all physicians' questions, were more likely to commit errors with potential clinical consequences and were less likely to mention medication side effects. No studies compared the rates of adverse events between patients who had access to a professional interpreter and those who did not or examined the incidence of adverse events in a hospital before and after the implementation of interpreter services

**Inappropriate Testing and Procedures** – Most of the studies reviewed suggested that the implementation of interpreter services, especially in the ED, can reduce inappropriate testing and procedures associated with language barriers (Bowen, 2004; Flores, 2005; Ku and Flores, 2005; Carter-Pokras et al., 2004).

The literature review identified only one study that examined the impact of interpreters on resource allocation including the use and cost of diagnostic testing and the use of IV fluids. Hampers & McNulty (2002) examined 4146 pediatric visits to the ED in 4 cohorts defined by language and interpreter use: English speaking, children with a language barrier but treated by a bilingual MD, children who used a professional interpreter, and children who had a language barrier but for whom a professional interpreter was unavailable. Compared to the English-speaking cohort, non-English speaking cases with a bilingual MD had similar rates of resource allocation. However, the cohort without access to a professional interpreter had a higher incidence and cost of testing and was more likely to receive IV's. The group who had an interpreter showed no difference in test costs or likelihood receiving an IV. The authors concluded that decision making was most cautious and expensive in the absence of a bilingual MD or professional interpreter.

**Hospital Utilisation** – A number of studies examined whether the use of professional interpreters was associated with hospital utilisation rates. Overall the literature reviewed suggested that the use of interpreters was associated with similar or lower odds of hospitalization (Flores, 2005; Ku and Flores, 2005; Carter-Pokras et al., 2004; Waxman & Levitt, 2000). However, McNulty & Hampers (2002) found that pediatric patients without an interpreter were more likely to be admitted (OR = 2.6).

It was clear from the literature that the use of professional interpreters leveled the playing field with respect to hospital length of stay. No differences were observed between the length of hospital stay among patient who had access to professional interpreters and those with English language proficiency (Flores, 2005; Ku and Flores, 2005; Carter-Pokras et al., 2004; Waxman & Levitt, 2000). The use of professional interpreters was also associated with similar or lower rates of ED use for adults (Flores, 2005; Ku and Flores, 2005; Carter-Pokras et al., 2004).

**Physician Time/Length of Clinic Visit** – Earlier literature examining the impact of interpreters on physician time was inconclusive (Jacobs et al., 2004). For example, one study of out-patients found that the length of an internal medicine visit for a patient using a professional interpreter was not significantly longer than that of an English-speaking patient (Tocher & Larson, 1999). Another study found that the length of visits of Russian- and Spanish-speaking patients using professional interpreters were significantly longer by an average of 7.1 and 12.2 minutes, respectively (Kravitz et al., (2000).

More recently, Fagan et al. (2003) examined the impact of





interpretation method on outpatient visit length using data from 613 consecutive visits to a Rhode Island teaching hospital-based primary care clinic (441 non-interpreted and 172 interpreted visits). Compared to patients not requiring an interpreter, patients using some form of interpretation experienced longer provider and clinic times (32.4 min vs. 28 min,  $p < .001$ ). This was particularly for patients who used telephone interpreters or who supplied their own interpreters. However patients who used a hospital interpreter did not experience significantly higher provider times or mean clinic times. These results were confirmed in a multivariate analysis. The use of telephone interpreters was associated with longer mean provider time (8.3 minutes) as was the use of an ad hoc interpreter (4.58 minutes). The authors suggested that the longer visit times associated with telephone interpreters might have been due to the time needed to call the interpreter service and get connected, the need to repeat statements and the lack of nonverbal communication. According to the review by Azarmina & Wallace (2005), the benefits of using face to face professional services vs telephone are mostly in terms of increasing efficiency by reducing non-interpretation time.

A number of other articles discussed why interpreters tend to be underutilized and the challenges of convincing physicians to use interpreters. While physicians cite time pressures and limited interpreter availability, professional interpreters are underused even when they are readily available. A qualitative study of the decision-making processes used by physicians when communicating with patients with language barriers revealed that the reasons are more complex, requiring interventions targeting both individual physicians and the practice environment (Diamond et al., 2009).

### 2.3 Cost-Benefit Analyses

This section reviews literature supporting the notion that while investing in professional interpretation services might require some upfront costs, it results in overall savings to the health care system. It has been suggested that economic evaluation must include the costs and consequences of both providing and not providing language access services (Bowen, 2004). From the perspective of a health institution, the costs of providing interpretation services include the interpreter's salary, training costs, office space, and overhead expenses. The costs of not providing a program could include a component of salaries for staff redirected from their duties to provide ad hoc interpretation, or used in attempting to locate interpretation assistance and other costs based on indicators emerging from the research (e.g. adverse events, physician time, inappropriate use of emergency department services, FU utilisation).

The paucity of research documenting the costs and benefits of providing interpretation services was well recognized (Jacobs et al., 2004; Bowen, 2004; Goode et al., 2006). This is partly

because it is difficult to identify, document and put a dollar amount on all possible costs and consequences of not providing interpretation services, some of which may be long-term. Furthermore, many institutions do not keep track of the costs of the interpretation services they provide; the costs of providing interpreter services vary widely and many institutions use combined approaches (Bowen, 2004). Finally some argue that this type of analysis masks fundamental issues of patient's rights and ethical care (Agger-Gupta, 2001).

Nevertheless, the literature review identified a few studies falling into three main categories. The first type of study compared health institutional costs before and after the implementation of interpretation services (i.e. full evaluations). Thus information on the 'costs' of the intervention (e.g., cost of providing interpreters) and the 'cost savings' of providing such services were estimated. The second type of study attempted to calculate the financial savings that would be achieved post-implementation of professional interpretation services based on efficiency markers (e.g., patient compliance, physician/staff time, unnecessary use of the ED and FU services and staff turnover) (e.g. partial evaluations). A third type category of partial review involved comparing two or more types of interpretation services with respect to quality of health, efficiency and cost outcomes. For example, the OMB (2002) estimated the costs for professional interpreters at \$20-26/hour and \$132/hour for language line services. This literature was not reviewed here.

#### Full Evaluations

Two full economic evaluations were identified in the peer-reviewed literature (Jacob et al., 2004; Jacobs et al., 2007).

- Jacobs et al. (2004) compared the cost of utilisation of primary care and ED services in a Massachusetts HMO before and after the introduction of professional interpreter services. The study took place in 4 health centres serving more than 122,000 patients from 1995-1997. The authors first calculated the average costs of interpretation in a large scale, round-the-clock interpreter services program in the primary care setting at \$79 per interpreted encounter (or \$2.40 in yearly premiums for HMO subscribers across the 4 health centers). In terms of efficiency outputs, the patients served by this program had increased hospital utilisation measured by the receipt of preventive services, physician visits, and drug prescriptions that translated into a net increase in service utilisation costs of \$45 per patient. The authors speculated that the provision of interpreter services may be more cost-effective over the long-term as a result of improved patient-physician communication, utilisation of preventive services and reduced complications/adverse events but that the financial consequence of providing professional interpreter services warrants further investigation.
- Jacobs et al. (2007) investigated the impact of an enhanced interpreter service on hospital costs (measured by LOS, in-patient consultation, radiology tests, FU appointments and



use of ED and patient satisfaction). The study participants included 323 Internal Medicine in-patients, 124 whose physicians had access to the enhanced interpreter intervention (2 trained interpreters assigned to work with patients throughout their stay), 99 whose physicians had access to the usual interpreter services (no interpreter, ad hoc or standard hospital interpreter) and 100 matched English-speaking participants. The study findings suggested that the enhanced interpreter intervention did not have a significant impact on any of the measured outcomes or their associated costs. However the cost of the enhanced program was small e.g. 1.5% of overall patient care. Add study limitations. . .

Other promising examples were identified from the 13 CLAS business case projects of the Alliance of Community Health Plans Foundation (ACHP, 2007). In 2000, the Office of Minority Health in the U.S. issued 14 standards for Culturally and Linguistically Appropriate Services (CLAS) as a means to correct inequities that currently exist in the provision of health services including culturally competent care, language access services and organizational supports for cultural competence. The cost-benefits achieved by diverse health care organizations (ranging from large integrated hospitals to small satellite clinics) that implemented the CLAS standards included:

- Substantial reductions in outsourced language interpretation services and subsequent savings in related costs. For example one health care organization, the Contra Costa Health Services Project, initiated a partnership among 4 hospitals to develop remote video/voice medical interpretation (RVMI). There was a cost-saving of \$.75/minute with partnership, pilot test savings over 10 weeks = \$25,000.
- More efficient use of staff time by reducing communication delays between patients and providers. For example, Contra Costa Health Services' remote video/voice medical interpretation project increased the number of patients served per day at considerable cost savings. The literature reviewed identified a number of articles that examined the benefits of remote interpretation: Gany et al. (2007) found that remote simultaneous was faster and more accurate than proximate simultaneous, remote consecutive and proximate ad hoc. A systematic review concluded that although the start up costs of remote interpretation may be high, these may be offset by efficiency gains (Azarmina & Wallace, 2005).
- Cost savings resulting from reduced use of the ED. For example, Telesalud Molina Healthcare employed a two-tiered model that used nonclinical staff to receive intake calls and registered nurses to receive calls requiring interpretation, clinical assessment or intervention nurse and interpreting assistance with 24 hour live and direct service. The 7 month pilot program produced a cost-savings of \$2,448 per month and replicated program yielded savings of \$750,000 across 8 states; 65% of callers who indicated that they initially intended to go to the ED had their needs met through the nurse or an office visit.

Findings from the 10 Hablamos Juntos demonstration projects

of the Robert Wood Foundation were less promising (Wu et al., 2007). The projects included a wide range of health care organizations e.g., 4 hospital systems, 2 HMOs, and community organizations. In most sites the primary intervention was increasing the availability of medical interpreters. Wu et al., (2007) evaluated costs (defined in terms of the dollar value of resources used in final year of project), barriers and facilitators and these varied depending on the size of hospital and number of interpreter units. The authors concluded that the business case is hard to make and thought that a quality of care or risk management argument make be more feasible and successful. Reflecting on these findings Goode et al. (2006) cautioned that a 2 year project period may have been too short to document the final cost-benefit of providing language access.

### Partial Evaluations

More of the studies reviewed conducted partial economic evaluations (Nazreen, 1997; Bernstein et al., 2002; Radar, 1988; Fagan et al., 2003). Some hospitals implemented interpretation service based on partial evaluations. These are described here.

Some studies attempted to calculate the cost savings obtained based on increased patient compliance and a reduction in hospital utilisation resulting from the provision of interpreter services. For example:

- In her PhD thesis, Nazreen (1997) examined whether providing interpreter services as an input variable would save health system costs by reducing hospital utilisation (e.g., use of ED), lab tests, physician time and improve patient compliance. This study was conducted in UMASS Medical Centre 1989-1995 before and after interpreter services were implemented. She imputed the cost of no shows and ED visits at \$29,150 per year and calculated that following the implementation of interpreter services there would be substantial savings due to improved patient compliance and a reduction of cancellations/no shows.
- Bernstein et al.'s (2002) earlier study calculated the impact of interpreter services on emergency department (ED) costs and found that the average charge was lowest for patients without interpreters, leading the authors to speculate that patients who did not have access to interpreters experienced poorer quality care. The cost of care for English-speaking patients was \$988 vs. \$878 for patients who had access to interpreters and \$710 for patients without access to interpreters. However, they also found that the use of professional interpreters was associated with reduced ED return rate and increased out-patient clinic utilisation without any simultaneous increases in length of stay or cost of visit.

Several studies calculated the institutional savings that could be obtained with the implementation of professional interpretation services in terms of professional staff time e.g., physician, nurse. For example:

- In one of the earliest studies retrieved, Rader (1988) examined the institutional costs of two alternatives to



language access. Using estimates of average interpretation time, the total number of hours per month of 'staff interpreter' time and salary information she showed that in a hospital where 50% of the interpretation was being provided by doctors and nurses, it was more cost-effective to hire additional interpreters than to use hospital staff ("opportunity cost").

- In their study examining impact of interpretation method on outpatient visit length, Fagan et al. (2003) estimated the potential savings that would result from eliminating the use of 'telephone' interpreters for Spanish-speaking patients. They determined the proportion of visits that required some form of interpreter and estimated with a patient volume of 18,000/year, the number of interpreted visits/year that would be held. Assuming that 18% of all interpreted visits used a telephone interpreter with a mean visit time 36.3 minutes they calculated the minutes (and cost) of telephone interpretation in a year (\$68,154/year). They determined that with an approximate annual cost of a full-time interpreter at \$30,000, 2 additional full-time interpreters could be hired with the cost savings from eliminating telephone interpreter use and would be extremely effective at institution where demand for interpreters is high.

Some studies calculated the increased revenue that could be generated by reducing the time physicians spent with patients through the provision of interpreter services. For example:

- One component of Nazreen's 1997 thesis involved a physician survey. Her findings indicated that 78% of physicians thought the use of an interpreter would reduce total care time so could see more patients. Increased revenue per day based on seeing more patients.
- Fagan et al. (2003) estimated the potential amount of physician time that could be saved by providing hospital interpreters for all Spanish-speaking patients. They calculated that with the provision of hospital interpreters they could expect a savings of 17,627 min/year (294 hours/year). At 30 minutes/visit, this would represent 588 additional visits/year = increased revenue.

It has been suggested that the provision of interpreter services may be associated with cost savings in terms of reductions in staff turnover given that staff employed by organizations which can not address linguistic and cultural barriers will be dissatisfied and leave (Goode et al., 2006). For example, the annual cost of staff turnover has been estimated at between 3.4-5.8% of hospital operating budgets (Waldman, 2004). However there was no research to date to support this claim.

## Summary

The literature reviewed demonstrated that there are substantial costs to not providing interpretation services in terms of health care inefficiencies (adverse events, excessive or unnecessary tests, prolonged hospital stays, cost of 'no shows' and physician time). However, fewer studies directly examined the monetary

costs of not providing interpreter services. This is clearly an area which warrants more investigation, especially in Canada.

## Other Implementation Challenges

The literature review identified a couple of studies describing the implementation challenges faced by Canadian health care institutions in the provision of professional interpretation services, namely, how they are funded and how services can be efficiently and cost effectively delivered. Although these studies are outside the Terms of Reference for this review, their findings have important implications for the efficiency and cost-effective delivery of interpreter services.

- Agger-Gupta's (2001) dissertation examined the factors and catalysts that influenced health care institutions (Canada and U.S.) to provide professional interpreter services. At the time she conducted her research only a few hospitals in Vancouver, Edmonton, Toronto and Montreal had full-time professional interpreters and there were no nationally recognized standards for interpreter training or certification processes in place. The community interpreter model i.e., all-purpose interpretation model with generic training for health care, legal and social service interpreting, featured prominently. Her findings suggested that in Canada, there has/had been little political, financial or legal impetus to provide interpretation services except for the Deaf, deafened and hard of hearing community. Furthermore, Canadian administrators believed that their liability risks were small. She concluded that the lack of reimbursement for interpretation services was a major impediment to implementation, thus mechanisms need to be developed to reimburse health care institutions for implementing these services. More recently, Flores et al., (2008) reached similar conclusions based on findings from their survey of NJ hospitals.
- Tang's 1999 review of the challenges faced by Canadian health care organizations to provide interpreter services featured the Multicultural Change in Health Services Delivery Project (involving 22 healthcare agencies in British Columbia) as a promising model of partnership and organizational change. To maximize cost-effectiveness and the equitable use of finite resources, she recommended the establishment of centralized interpreter services to organize the intake and dispatch of professional interpreter services, monitor standards of services, and provide ongoing training. She suggested that this centralized system would be particularly beneficial to small institutions because of the sharing of administrative costs and by contracting services with existing community organizations that already have expertise in providing interpreter services. In addition, this type of system can function as an effective pooling system for translating materials and community resources, such as professional community interpreters (Tang, SY, 1999; Multicultural Change in Health Services Delivery Project, 1997). More recently, others (e.g. Bowen, 2004;) have also concluded that centralized interpretation services are most efficient and cost effective.



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## CONCLUSIONS

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The literature review provided strong international evidence of the negative impacts of language barriers on health care quality, efficiency and cost. There was also ample evidence that failing to address language barriers through the provision of professional interpreters had major consequences in terms of health care quality, efficiency and cost, although the absolute costs of failing to address language barriers were not always well-documented.

Even though research to support the business case is still a work in progress (Goode et al., 2007), it appears that the cost of providing professional interpreter services is quite low relative to other health care costs. More research is needed on the cost benefit of providing interpreter services (Goode et al., 2007; Jacobs et al., 2006; Karliner et al., 2007) and on the effectiveness and costs of different types of interpreter services (Flores, 2005). More research is also needed to evaluate strategies designed to reduce racial and ethnic health disparities (Beach et al., 2006).

There was some consensus in the literature that the provision of language access services should not be viewed as a separate 'add-on' program, but as an essential component of a strategy to meet organizational goals e.g., to manage risk, improve quality, reduce health disparities and establish partnerships with marginalized communities. Language access services appear to be most efficient and cost effective when organized at a regional (rather than facility) level.



## REFERENCES

- Adams, K. (2007). Should the NHS curb spending on translation services? *BMJ*, 334(7590), 398.
- Agency for Healthcare Research and Quality. (2006). Efficiency in Health Care: What does it mean? How is it measured? How can it be used for Value Based Purchasing? Retrieved February, 2009 from: <http://www.ahrq.gov/qual/efficiency/hcemch2.htm#framework>
- Agger-Gupta, Niels. (2001). From 'making do' to established service, the development of health care interpreter services in Canada and the United States of America: A grounded theory study of health organization change and the growth of a new profession. Fielding Graduate University, 227 pages AAT 3013068
- Alberta Health Services Calgary Health Region. (2008). Best Practices in interpretation and translation services. Literature Review and Environmental Scan.
- Alliance of Community Health Plans. (2007). Making the Business Case For Culturally and Linguistically Appropriate Services in Health Care. Retrieved Jan 2009 from: [http://www.achp.org/page.asp?page\\_id=1059](http://www.achp.org/page.asp?page_id=1059)
- Aspden, P., Corrigan, J., & Wolcott J. (2004). In Aspden P., Corrigan J. and Wolcott J. (Eds) (Eds.), *Patient Safety: Achieving a New Standard for Care* (<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1490255&tool=pmcentrez> ed.). Washington, DC: Institute of Medicine.
- Azarmina, P., & Wallace, P. (2005). Remote interpretation in medical encounters: a systematic review. *J Telemed Telecare*, 11(3), 140-145.
- Bailit, M, and Dyer, M.B. (2004). Beyond Bankable Dollars: Establishing a Business Case for Improving Health Care. The Commonwealth Fund, September.
- Bard, M. R., Goettler, C. E., Schenarts, P. J., Collins, B. A., Toschlog, E. A., Segraves, S. G., et al. (2004). Language barrier leads to the unnecessary intubation of trauma patients. *The American Surgeon*, 70(9), 783-786.
- Beach, M. C., Gary, T. L., Price, E. G., Robinson, K., Gozu, A., Palacio, A., et al. (2006). Improving health care quality for racial/ethnic minorities: a systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health*, 6, 104.
- Bernstein, J., Bernstein, E., Dave, A., Hardt, E., James, T., Linden, J., et al. (2002). Trained Medical Interpreters in the Emergency Department; Effects on Services, Subsequent Charges, and Follow-up. *Journal of Immigrant Health*, 4(4), 171-176.
- Bowen S. (2004). Language barriers within the Winnipeg health authority. Evidence and implications. September.
- Brach, C., & Fraser, I. (2002). Reducing disparities through culturally competent health care: an analysis of the business case. *Quality Management in Health Care*, 10(4), 15-28
- Canadian Institute for Health Information. (2008). The Cost of Acute Care Hospital Stays by Medical Condition in Canada: 2004-2005. Ottawa: CIHI.
- Carter-Pokras O, O'Neill MJF, Cheanvechai V, Menis M, Fan T and Solera A. (2004). Providing Linguistically Appropriate Services to Persons With Limited English Proficiency: A Needs and Resources Investigation.
- Chan, Y. F., Alagappan, K., Rella, J., Bentley, S., Soto-Greene, M., & Martin, M. (2008). Interpreter services in emergency medicine. *The Journal of Emergency Medicine*,
- Chen, A. H., Youdelman, M. K., & Brooks, J. (2007). The Legal Framework for Language Access in Healthcare Settings: Title VI and Beyond. *J GEN INTERN MED*, 22(2), 362-367.
- Clemans-Cope, L., & Kenney, G. (2007). Low income parents' reports of communication problems with health care providers: effects of language and insurance. *Public Health Reports (Washington, D. C.: 1974)*, 122(2), 206-216.
- Cohen, A. L., Rivara, F., Marcuse, E. K., McPhillips, H., & Davis, R. (2005). Are Language Barriers Associated With Serious Medical Events in Hospitalized Pediatric Patients? *Pediatrics*, 116(3), 575-579.
- Conference Board of Canada. (2008). Healthy people, health performance, healthy profits. The Case for Business Action on the Socio-Economic Determinants of Health. Retrieved Jan 2009 from: [http://urgencyleadership.lesaffaires.com/attachments/479\\_Conference%20Board%20Report%20-%20Healthy%20employees.pdf](http://urgencyleadership.lesaffaires.com/attachments/479_Conference%20Board%20Report%20-%20Healthy%20employees.pdf)
- Diamond, L. C., Schenker, Y., Curry, L., Bradley, E. H., & Fernandez, A. (2009). Getting by: underuse of interpreters by resident physicians. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 24(2), 256-262.
- Divi, C., Koss, R. G., Schmaltz, S. P., & Loeb, J. M. (2007). Language proficiency and adverse events in US hospitals: a pilot study. *Int J Qual Health Care*, 19(2), 60-67.
- Drennan, G. (1996). Counting the cost of language services in psychiatry. *South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde*, 86(4), 343-345.
- Elixhauser, A., Weinick, R. M., Betancourt, J. R., & Andrews, R. M. (2002). Differences between Hispanics and non-Hispanic Whites in use of hospital procedures for cerebrovascular disease. *Ethnicity & Disease*, 12(1), 29-37.
- Fagan, M. J., Diaz, J. A., Reinert, S. E., Sciamanna, C. N., & Fagan, D. M. (2003). Impact of interpretation method on clinic visit length. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 18(8), 634-638.
- Flores, G., Rabke-Verani, J., Pine, W., & Sabharwal, A. (2002). The importance of cultural and linguistic issues in the emergency care of children. *Pediatric Emergency Care*, 18(4), 271-284.
- Flores, G., Laws, M. B., Mayo, S. J., Zuckerman, B., Abreu, M., Medina, L., et al. (2003). Errors in medical interpretation and their potential clinical consequences in pediatric encounters. *Pediatrics*, 111, 6-14.
- Flores, G., Torres, S., Holmes, L. J., Salas-Lopez, D., Youdelman, M. K., & Tomany-Korman, S. C. (2008). Access to hospital interpreter services for limited English proficient patients in New Jersey: a statewide evaluation. *Journal of Health Care for the Poor and Underserved*, 19(2), 391-415.
- Flores, G. (2005). The Impact of Medical Interpreter Services on the Quality of Health Care: A Systematic Review. *Med Care Res Rev*, 62(3), 255-299.
- Gadon, M., Balch, G. I., & Jacobs, E. A. (2007). Caring for patients with limited English proficiency: the perspectives of small group practitioners. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 22 Suppl 2, 341-346.
- Galbraith, A. A., Semura, J. I., McAninch-Dake, R. J., Anderson, N., &



- Christakis, D. A. (2008). Language disparities and timely care for children in managed care Medicaid. *The American Journal of Managed Care*, 14(7), 417-426.
- Gany, F., Kapelusznik, L., Prakash, K., Gonzalez, J., Orta, L. Y., Tseng, C., et al. (2007). The Impact of Medical Interpretation Method on Time and Errors. *J GEN INTERN MED*, 22(2), 319-323.
- Garcia, E. A., Roy, L. C., Okada, P. J., Perkins, S. D., & Wiebe, R. A. (2004). A Comparison of the Influence of Hospital-Trained, Ad Hoc, and Telephone Interpreters on Perceived Satisfaction of Limited English-Proficient Parents Presenting to a Pediatric Emergency Department. *Pediatric Emergency Care*, 20(6), 373-378.
- Goldman, R. D., Amin, P., & Macpherson, A. (2006). Language and length of stay in the pediatric emergency department. *Pediatric Emergency Care*, 22(9), 640-643.
- Goode TD, Dunne MC, and Bronheim SM. (2006). The Evidence Base for Cultural and Linguistic Competency in Health Care. The Commonwealth Fund, October. Retrieved Jan 2009 from: [http://www.commonwealthfund.org/publications/publications\\_show.htm?do\\_c\\_id=413821](http://www.commonwealthfund.org/publications/publications_show.htm?do_c_id=413821)
- Graham, E. A., Jacobs, T. A., Kwan-Gett, T. S., & Cover, J. (2008). Health services utilization by low-income limited English proficient adults. *Journal of Immigrant and Minority Health / Center for Minority Public Health*, 10(3), 207-217.
- Green, A. R., Ngo-Metzger, Q., Legedza, A. T., Massagli, M. P., Phillips, R. S., & Iezzoni, L. I. (2005). Interpreter services, language concordance, and health care quality. Experiences of Asian Americans with limited English proficiency. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 20(11), 1050-1056.
- Hampers, L. C., & McNulty, J. E. (2002). Professional interpreters and bilingual physicians in a pediatric emergency department: effect on resource utilization. *Archives of Pediatrics & Adolescent Medicine*, 156(11), 1108-1113.
- Hampers, L. C., Cha, S., Gutglass, D. J., Binns, H. J., & Krug, S. E. (1999). Language barriers and resource utilization in a pediatric emergency department. *Pediatrics*, 103(6), 1253-1256.
- Hunt, L. M., & de Voogd, K. B. (2007). Are good intentions good enough? Informed consent without trained interpreters. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 22(5), 598-605.
- Interpreter services in an inner city teaching hospital: a 6-year experience. (2006). *Annals of the Royal College of Surgeons of England*, 88(7), 659.
- Jacobs, E., Chen, A. H., Karliner, L. S., Agger-Gupta, N., & Mutha, S. (2006). The need for more research on language barriers in health care: a proposed research agenda. *The Milbank Quarterly*, 84(1), 111-133.
- Jacobs, E. A., Karavolos, K., Rathouz, P. J., Ferris, T. G., & Powell, L. H. (2005). Limited English proficiency and breast and cervical cancer screening in a multiethnic population. *American Journal of Public Health*, 95(8), 1410-1416.
- Jacobs, E. A., Sadowski, L. S., & Rathouz, P. J. (2007). The impact of an enhanced interpreter service intervention on hospital costs and patient satisfaction. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 22 Suppl 2, 306-311.
- Jacobs, E. A., Shepard, D. S., Suaya, J. A., & Stone, E. L. (2004). Overcoming language barriers in health care: costs and benefits of interpreter services. *American Journal of Public Health*, 94(5), 866-869.
- Jiang, H. J., Andrews, R., Stryer, D., & Friedman, B. (2005). Racial/ethnic disparities in potentially preventable readmissions: the case of diabetes. *American Journal of Public Health*, 95(9), 1561-1567.
- John-Baptiste, A., Naglie, G., Tomlinson, G., Alibhai, S. M., Etmells, E., Cheung, A., et al. (2004). The effect of English language proficiency on length of stay and in-hospital mortality. *Journal of General Internal Medicine : Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 19(3), 221-228.
- Karliner, L. S., Jacobs, E. A., Chen, A. H., & Mutha, S. (2007). Do professional interpreters improve clinical care for patients with limited English proficiency? A systematic review of the literature. *Health Services Research*, 42(2), 727-754.
- Kirmayer, L. J., Rousseau, C., Guzder, J., & Jarvis, G. E. (2008). Training clinicians in cultural psychiatry: a Canadian perspective. *Academic Psychiatry*, 32(4), 313-319.
- Ku, Leighton and Flores, Glenn. (2005). Pay Now Or Pay Later: Providing Interpreter Services In Health Care. *Health Affairs*, 24(2), 435-444. Retrieved January 11, 2009, from ABI/INFORM Global database.
- Lee, L., Batal, H., Maselli, J., & Kutner, J. (2002). Effect of spanish interpretation method on patient satisfaction in an urban walk-in clinic. *Journal of General Internal Medicine*, 17(8), 641-646.
- Liu, R., So, L., & Quan, H. (2007). Chinese and white Canadian satisfaction and compliance with physicians. *BMC Family Practice*, 8, 11.
- Massachusetts General Hospital. (2008). Improving Quality and Achieving Equity: A Guide for Hospital Leaders. Retrieved January 2009 from: <http://www2.massgeneral.org/disparitiessolutions/guide.html>
- Massachusetts Department of Public Health. (2007). Best Practice Recommendations for Hospital-Based Interpreter Services. Retrieved January 2009 from: [http://www.hablamosjuntos.org/pdf\\_files/Best\\_Practice\\_Recommendations\\_Feb2004.pdf](http://www.hablamosjuntos.org/pdf_files/Best_Practice_Recommendations_Feb2004.pdf)
- Nazreen, K. (1998). Language barriers to health care: Cost-benefit analysis of providing interpreter services at health care settings. Brandeis University, The F. Heller Graduate. School for Advanced Study In Social Welfare, Published in ProQuest Digital Dissertations / Dissertation Abstracts. [http://www.lib.umi.com/dxweb/details?doc\\_no=861906](http://www.lib.umi.com/dxweb/details?doc_no=861906)
- Ngo-Metzger, Q., Sorkin, D. H., Phillips, R. S., Greenfield, S., Massagli, M. P., Clarridge, B., et al. (2007). Providing High-Quality Care for Limited English Proficient Patients: The Importance of Language Concordance and Interpreter Use. *J GEN INTERN MED*, 22(2), 324-330.
- Office of Management and Budget. (2002). Report to Congress. Assessment of the Total Benefits and Costs of Implementing Executive Order No. 13166:
- Improving Access to Services for Persons with Limited English Proficiency. Retrieved Feb 2009 from: <http://www.usdoj.gov/crt/cor/lep/omb-lepreport.pdf>
- Partida, Y. (2007). Addressing Language Barriers: Building Response Capacity for a Changing Nation. *J GEN INTERN MED*, 22(2), 347-349.
- Perkins, J., Youdelman, M., Wong, D. (2003). *Ensuring Linguistic Access in Health Care Settings: Legal Rights & Responsibilities*. August. Retrieved February 2009 from:



<http://www.kff.org/uninsured/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=22093>

- Rader, G. S. (1988). Management decisions: do we really need interpreters? *Nursing Management*, 19(7), 46-48.
- Ramirez, D., Engel, K. G., & Tang, T. S. (2008). Language interpreter utilization in the emergency department setting: a clinical review. *Journal of Health Care for the Poor and Underserved*, 19(2), 352-362.
- Saha, S., Fernandez, A., & Perez-Stable, E. (2007). Reducing Language Barriers and Racial/Ethnic Disparities in Health Care: An Investment in Our Future. *J GEN INTERN MED*, 22(2), 371-372.
- Sarver, J., & Baker, D. (2000). Effect of language barriers on follow-up appointments after an emergency department visit. *Journal of General Internal Medicine*, 15(4), 256-264.
- Schwend, G. T. (2008). The language of healthcare. Variance in the English language is harming patients and hospitals' bottom lines. Is healthcare IT the solution? *Health Management Technology*, 29(2), 14, 16, 18.
- Schyve, P. M. (2007). Language Differences as a Barrier to Quality and Safety in Health Care: The Joint Commission Perspective. *J GEN INTERN MED*, 22(2), 360-361.
- Shiell, A., Donaldson, C., Mitton, C., & Currie, G. (2002). Health economic evaluation. *J Epidemiol Community Health*, 56(2), 85-88.
- Smedley, B. D., Stith, A. Y. & Nelson, A. R. (Eds.). (2003). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Available at: <http://www.nap.edu/catalog/10260.html>
- Stolk, Y., Ziguris, S., Saunders, T., Garlick, R., Stuart, G., & Coffey, G. (1998). Lowering the language barrier in an acute psychiatric setting. *The Australian and New Zealand Journal of Psychiatry*, 32(3), 434-440.
- Tang, S. Y. (1999). Interpreter Services in Healthcare: Policy Recommendations for Healthcare Agencies. *Journal of Nursing Administration*, 29(6), 23-29.
- The Joint Commission Sentinel Event Statistics. (2005). Retrieved Feb. 2009 from: <http://www.jointcommission.org/SentinelEvents/statistics>
- Tocher, T. M., & Larson, E. B. (1999). Do physicians spend more time with non-english-speaking patients? *J GEN INTERN MED*, 14(5), 303-309.
- Waldman, J. D., Kelly, F., Aurora, S., & Smith, H. L. (2004). The Shocking Cost of Turnover in Health Care. *Health Care Management Review*, 29(1), 2-7.
- Waxman, M. A., & Levitt, M. A. (2000). Are diagnostic testing and admission rates higher in non-English-speaking versus English-speaking patients in the emergency department? *Annals of Emergency Medicine*, 36(5), 456-461.
- Wilson-Stronks A, Galvez E. (2007). *Hospitals, Language, and Culture: A Snapshot of the Nation*. Oakbrook Terrace, IL: The Joint Commission.
- Wu, S., Ridgely, M. S., Escarce, J. J., & Morales, L. S. (2007). Language access services for Latinos with limited English proficiency: lessons learned from Hablamos Juntos. *Journal of General Internal Medicine: Official Journal of the Society for Research and Education in Primary Care Internal Medicine*, 22 Suppl 2, 350-355.
- Yoo, H. C., Gee, G. C., & Takeuchi, D. (2009). Discrimination and health among Asian American immigrants: Disentangling racial from language discrimination. *Social Science & Medicine*, 68(4), 726-732.

## Websites:

- National Council on Interpreting in Health Care. Searchable bibliography. <http://www.ncihc.org/mc/page.do>
- Speaking Together [www.speakingtogether.org](http://www.speakingtogether.org)
- Hablamos Juntos. <http://hablamosjuntos.org/resources/default.asp#int>

