

# The Impact of Language and Ethnicity on Preparation for Endoscopy: A Prospective Audit of an East London Hospital Ward

Ryan Essex - r.w.essex@greenwich.ac.uk

Mihaela Cucos

Lesley Dibley

## Abstract

### Rationale, aims and objectives

The efficacy, cost-effectiveness and safety of a number of endoscopic procedures is largely dependent on optimal preparation. Despite this however, inadequate or suboptimal preparation is relatively common. Most studies have revealed inadequate preparation for between 20-30% of patients. This audit sought to examine the impact of English language proficiency, and ethnicity, on endoscopic preparation and procedure success or failure

### Method

A prospective audit was developed. Using convenience sampling, participants were consecutive patients recruited over a six-month period, who were aged 18 and over, attending an east London endoscopy ward for a routine (pre-booked) endoscopy procedure for which they had received preparation instructions to carry out at home.

### Results

Almost one third of the sample had adequate or very poor English proficiency. When an interpreter was used it was overwhelmingly a member of the patients' family or a member of staff. There was no significant relationship between gender, age, ethnic group, English

language proficiency, whether an interpreter was needed, the type of procedure carried out and inadequate preparation

## Conclusions

Amongst these patients we found that a little more than 20% of participants were inadequately prepared for their endoscopic procedure. We found no relationship between language proficiency on preparation. Given the mixed literature on interventions to improve preparation before endoscopic procedures, further directions are identified to work toward the development and testing of a novel intervention amongst this population. In identifying those who may be at risk for inadequate preparation for endoscopic procedures, practice needs to take into account a range of factors beyond language and ethnicity. Furthermore, the persistent reliance on family members to interpret information sheets and preparation advice suggests that revision and / or development of culture and language-specific materials is necessary.

Keywords: endoscopy, gastroscopy, predictors, preparation, ethnicity, language

# The Impact of Language and Ethnicity on Preparation for Endoscopy: A Prospective Audit of an East London Hospital Ward

## Introduction

The efficacy, cost-effectiveness and safety of a number of endoscopic procedures is largely dependent on optimal preparation. Inadequate preparation for various endoscopic procedures has multiple consequences. It impacts on diagnostic accuracy and safety (1, 2) and is a lead cause for the need for repeat procedures (3). Despite this however, inadequate or suboptimal preparation is relatively common. Most studies have revealed inadequate preparation for between 20-30% of patients (4-6). Sidhu and Geraghty (7) performed an audit of all colonoscopies performed between April 2005 and 2010 at one UK Hospital. Of the 8910 colonoscopies performed, 693 were incomplete (7.8%). Inadequate preparation was the most common reason for incomplete colonoscopy, accounting for nearly 25% of failed procedures. Inadequate preparation unsurprisingly comes with increased financial costs. In a US study Yadlapati and Johnston (8) calculated that hospital costs for patients with an inadequate colonoscopy preparation were 1.3 times greater on average compared to those with adequate preparation.

Several factors that predict suboptimal preparation are identified in the literature. Amongst 10,921 patients in the US, Lebowitz, Wang (6) determined that suboptimal preparation was higher amongst those using Medicaid and those who were single, older and male. Amongst a sample of 2,811 in Italy, suboptimal preparation was higher amongst those who were overweight or had a higher BMI, male, older, had previous colorectal surgery or who suffered from a number of comorbidities, such as cirrhosis and diabetes (9). Since these studies almost

a decade ago there has been substantial exploration into predictors of preparation. Two recent systematic reviews shed further light on this picture. Gandhi, Tofani (10) sought to explore patient characteristics that predicted suboptimal preparation and performed a meta-analysis of 67 studies, comprising 75,818 patients. The review suggests that cirrhosis, diabetes, stroke, dementia, opioid use, and tricyclic antidepressant use had the most significant impact on suboptimal bowel preparation. Mahmood, Farooqui (11) performed a meta-analysis of 24 studies, comprising 49,868 patients and similar to the studies above found that age, male sex, inpatient status, diabetes, hypertension, cirrhosis, narcotic use, constipation, stroke, and tricyclic antidepressant use were factors associated with inadequate bowel preparation. Importantly this study also stratified this sample into Western and Asian countries, finding that diabetes, cirrhosis, male sex, previous history of stroke, and tricyclic antidepressant use were only risk factors in populations of Western countries, but not in Asian populations. Mahmood et al. (11) conclude that, “[t]here is a complex interplay among patient characteristics and environmental factors that affect the overall outcome of bowel preparation quality. Physicians must be aware of the risk factors that are specific to the patient populations with whom they interact”.

The ability to comprehend bowel preparation instructions has also been shown as being important in promoting optimal preparation (12). To the authors’ knowledge, the only study to examine the impact of language proficiency on preparation (13) suggests that the need for an interpreter was one of the major predictors for suboptimal preparation.

The local population of east London is multicultural, with an eclectic mix of numerous ethnic groups, spanning several generations. Whilst younger generations who have been born and raised in the area are commonly more likely to be competent English-speakers, previous

generations, including the original migrating generation of now elderly family members, may be more likely to adhere to their native language, and rely on younger family members for translation. This older population are also more likely to require endoscopic procedures for a wide range of gastrointestinal conditions that become more prevalent with age.

Nursing staff in the endoscopy unit at one hospital within a large east London National health Service (NHS) Trust reported a large number of non-English-speaking patients who required access to translation services. Staff also observed a high rate of procedure failure. Instructions for preparation for all endoscopy procedures are routinely provided in English, and this language barrier was believed to be the primary cause of poor preparation and procedure failure. Trust policy states that clinical staff and members of the patient's family should not be called upon to translate for the patient due to concerns about conflicts of interest and patient confidentiality. Staff are required to make use of the official telephone-based translation services commissioned by the Trust from an external, private supplier. However, appointments have to be booked in advance, and the need for the translator was often not known until the patient arrived at the endoscopy unit to be admitted for their procedure.

We therefore conducted a prospective audit to examine the impact of language proficiency and ethnicity on endoscopic preparation and procedure success or failure and identify areas for improvement in service delivery.

## Method

### Design

We conducted a prospective audit comprising the first three stages of the audit cycle as described by Benjamin (14) (preparing for audit, selection criteria for audit review, measuring

level of performance) to identify the relevant areas for improvement [Figure 1]. Stages four and five (making improvements and sustaining improvements) are planned as a result of analysis of this initial audit data.

### Participants

Using convenience sampling, participants were consecutive patients recruited over a six month period in 2019, aged 18 and over, attending an east London endoscopy ward for a routine (pre-booked) endoscopy procedure for which they had received preparation instructions to carry out at home.. The target sample size was 1000 participants.

### Materials

Development of the audit tool [Figure 2] was guided by the first two stages of Benjamin's (14) model:

**Stage 1 -Preparing for the audit:** Endoscopy unit nursing staff were consulted to gain insight into the issues they observed as influential in the quality of preparation for, and risk of failure of, endoscopic procedures

**Stage 2 – Selecting criteria for audit review:** The draft audit tool was developed to include a range of demographic variables related to gender, ethnicity, English language proficiency, the need for an interpreter and whether patients' preparation for the procedure in question was adequate. We used Government and NHS categories to record ethnicity and language, respectively, and piloted the draft tool with the endoscopy unit staff to confirm clarity and content. Minor revisions were made to reduce risk of misinterpretation of items, before the audit tool was finalised.

## Ethics

The audit was approved as a service improvement project by the clinical excellence team at the NHS Trust, thus confirming that ethics approval was not required.

## Procedure

For Stage 3 - Measuring level of performance, nursing staff completed the audit document with each consecutive eligible patient attending a routine (pre-booked) appointment at one east London endoscopy unit, as part of the regular admission process for day procedures. Completed audit forms were collected regularly from the endoscopy unit by the lead author, who also carried out all data entry.

## Data analysis

Data analysis was conducted in IBM SPSS statistics version 23. Data from 828 patients were screened and audits with substantial missing or contradictory responses were excluded (n = 28; 3%), with 800 questionnaires included in the analysis. A series of analyses were carried out to explore the demographic characteristics of the sample, while chi square tests for independence were carried out to examine these characteristics and inadequate preparation.

## Results

### Sample characteristics

Data were collected between July 2019 and January 2020. Participants across all age groups were represented with majority aged between 41-50 (n = 186; 24%), 51-60 (n = 148; 19%) 61-70 (n = 147; 19%) years old. Gender of patients was evenly split. Those who identified as Asian or Asian British (n = 416; 52%) made up the largest group in this study. Those who identified as White (n = 241; 30%) and Black, African, Caribbean and Black British (n = 97; 12%) were

the other major ethnic groups in this sample [Table 1]. Almost two thirds were proficient in English language (n = 569; 72%), while almost one third of the sample had adequate (n = 97; 12%) or very poor English proficiency (n = 124; 16%). A large portion of patients spoke at least one language other than English (n = 322; 40%). Almost one fifth of patients required an interpreter (n = 156; n = 20%). When an interpreter was used it was overwhelmingly a member of the patients' family (n = 95; 78%) or a member of staff (n = 24; 20%). An interpreter (including family members and staff) was unavailable for only a small number of patients (n = 12; 2%).

#### Procedures and preparation

Gastroscopy (n = 456; 57%) and colonoscopy (n = 225; 28%) were the most common procedures performed. Only a small number of patients did not progress to the procedure because of inadequate preparation (n = 13; 2%). However at least 21% (n = 170) were identified as having been inadequately prepared for their procedure.

#### Relationship between preparation and demographic characteristics

Direct logistic regression was performed to assess the impact of a number of factors on the likelihood that participants were inadequately prepared for their procedure. The model contained three independent variables (age, gender and need for a translator). The full model containing all predictors was not statistically significant,  $\chi^2(8, N = 657) = 8.93, p = .35$ , indicating that the model was not able to distinguish between participants who were and were not adequately prepared. Because a number of variables could not be included in this model, due to collinearity, further analyses were carried out to explore these relationships.



A series of chi square tests for independence were carried out to examine the relationship between demographic characteristics and inadequate preparation. There was no significant relationship between gender, age, ethnic group, English language proficiency, whether an interpreter was needed, the type of procedure carried out and inadequate preparation [Table 2]. These results suggest that rates of inadequate preparation were no higher or lower amongst those with any of the above characteristics.

## Discussion

The data from this sample of 800 is modest, and is not intended to compete with or emulate the much more complex analyses that can be carried out with big data sets, but to shed some light on the issues a single endoscopy unit is facing in terms of the perceived influences on adequate preparation for endoscopy. Prior to the audit, the clinical staff were united in their perception that language formed a barrier to adequate preparation. Although we found that a little more than 20% of participants were inadequately prepared for their endoscopic procedure, we cannot demonstrate any differences between gender, ethnic group, language proficiency, the use of an interpreter or the type of procedure that was carried out, suggesting that these factors did not play a role in influencing preparation. While the overall rate of inadequate preparation is comparable to other studies, the fact that no relationship was found between preparation and other variables is somewhat surprising, particularly given the results of previous studies that suggest variables such as gender and age impact preparation. Perhaps most surprising however is not finding any apparent impact of language proficiency on preparation, particularly given past studies that have shown both comprehension of instructions (12) and the need for an interpreter (13) to be major factors in predicting preparation. There are a number of possible explanations as to why this was the case. The majority of patients relied on relatives to interpret for them in appointments, suggesting they had access to someone who could translate English

language preparation instructions at home, potentially improving preparation amongst some participants. Further, although two thirds of patients had poor to adequate English language, only a fifth of patients reported needing an interpreter – this may reflect a reluctance to request and accept ‘external’ help in the shape of an official interpreter provided by the Trust, and a preference for relying on family members to perform this role, rather than being a clear indicator of need for interpretation assistance.

However, although there were no significant differences between groups, 20% of participants were inadequately prepared for their procedure. The UK Key Performance Indicators & Quality Assurance Standards for Colonoscopy (15) for example, suggests that a minimum standard of 90% and aspirational target of 95% for adequate preparation for colonoscopy. Despite being inadequately prepared, the majority of procedures went ahead – but we do not know either the rationale for continuing with inadequately prepared patients, or how successful those procedures were.

This audit evidences that currently, this endoscopy unit does not reach the minimum standard for adequate preparation for colonoscopy. The mixed evidence in relation to the impact of gender, age, ethnic group, language and need for interpretation, might also suggest that independent of these factors and the patients’ language preferences, the instructions provided for preparation might themselves be inadequate. If this is the case, then reviewing the preparation instructions in line with current guidelines and recommendations (e.g., 16, 17) would seem the appropriate place to begin efforts to improve the standard of patient preparation, before moving on to develop cultural and language -specific versions of the same information.

## Limitations

As noted above, this audit did not account for a range of potentially confounding variables, including socioeconomic and other individual level variables, such as BMI and comorbid conditions; future research should aim to address this. Further limitations relate to data collection. To measure preparation, we relied on the clinical judgement of our colleagues conducting the consultation, as opposed to using a validated measure. This may mean that there was some variation between clinicians as to what inadequate preparation was, which may have impacted our reported preparation rate. Furthermore, and more generally, audits were completed by several different clinical colleagues, which may have resulted in slightly different interpretation of audit items and affected the number of missing items and consequently, the results.

## Recommendations

This preliminary audit provides direction for future investigation, that will give greater insight into how to improve preparation rates and whether any difference exists between language and ethnic groups. First, further development of pre-preparation procedures including language-specific information pamphlets specific to the hospital and Trust should be carried out. Second, a more comprehensive audit, including a qualitative component, should explore the many demographic and socioeconomic factors which may explain why inadequate preparation is so high and improve sensitivity to relevant variables. Each of these points are important, as while a number of interventions have been tested in the literature, the evidence is somewhat mixed (16) and it looks likely that for diverse populations, such as the one represented in this sample, a novel strategy will need to be tested. Finally, this audit highlights the need to adhere to Trust policy by finding responsive ways of using professional interpreters and translated education

materials. This may improve preparation rates further and empower patients in decision-making about their health.

## Conclusion

Despite local staff perceptions, failure rate for endoscopic procedures was relatively low, although several procedures went ahead despite recognition of poor preparation. The effectiveness (how clear the visual field was, and how well the procedure met its purpose) of those procedures is unknown. The persistent reliance on family members to interpret information sheets and preparation advice suggests that revision and / or development of culture and language-specific materials for patients in this Trust / unit, is necessary.

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## Acknowledgements

We would like to thank Lea Sabiniano & Elena Darloman for their assistance with this project.

## Conflicts of interest

None declared.

## Tables and Figures

**Table 1. Age and ethnic group of patients**

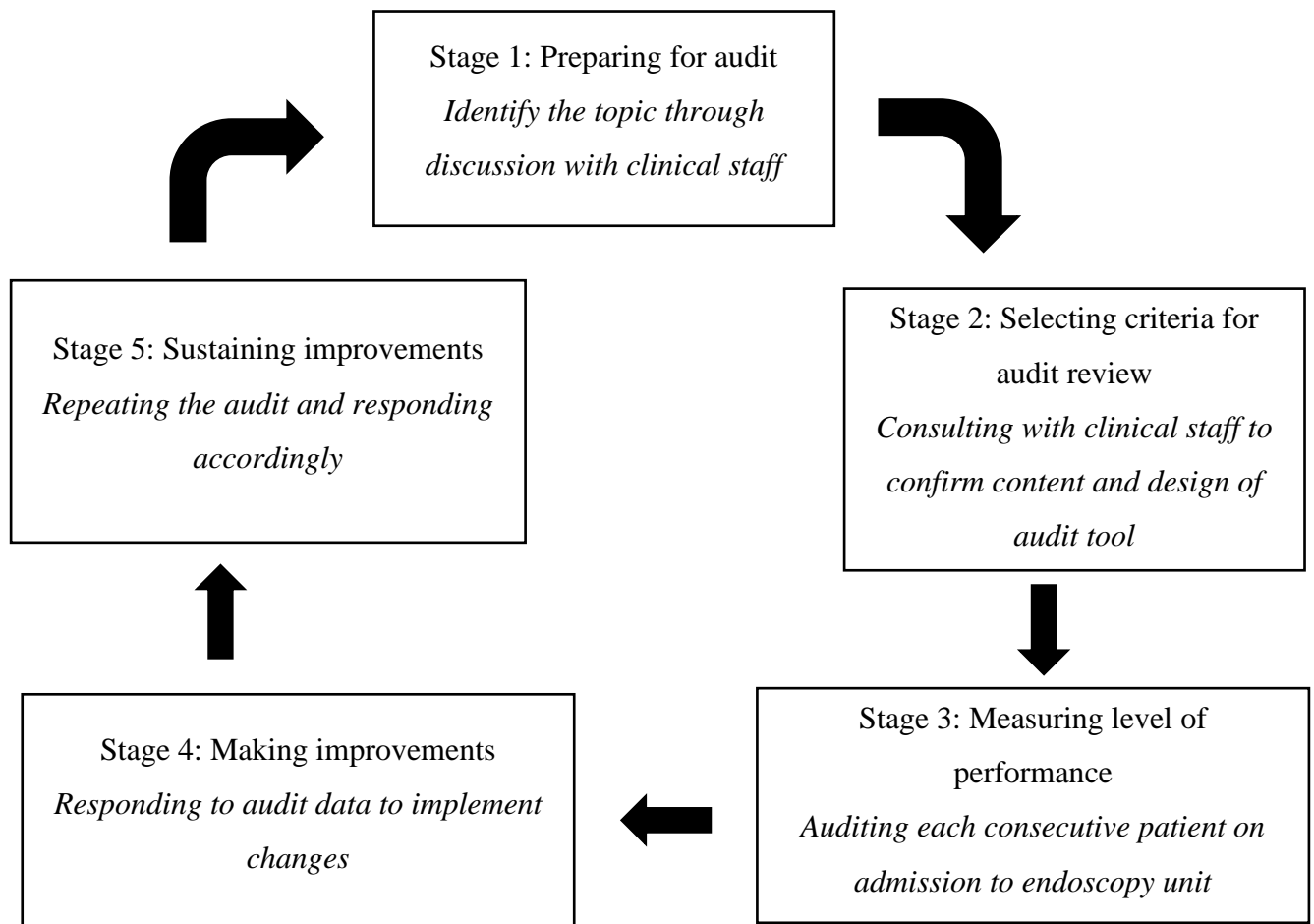
Age	Ethnic group					Total
	Asian/ Asian British	Black/African/ Caribbean/Black British	Mixed/ Multiple ethnic groups	White	Other	
	18-30	26	10	2	26	
31-40	70	13	3	36	3	125
41-50	100	30	6	42	5	183
51-60	75	17	3	49	3	147
61-70	74	12	2	54	5	147
71-80	48	7	2	25	1	83
80+	8	8	1	7	0	24
<b>Total</b>	<b>401</b>	<b>97</b>	<b>19</b>	<b>239</b>	<b>22</b>	<b>778</b>



**Table 2. Relationship between preparation and demographic characteristics**

		<b>Adequately prepared?</b>		Chi square test of independence
		n = yes (%)	n = no (%)	
<b>Age</b>	18-30	51 (74%)	18 (26%)	$\chi^2 (6, n = 776) = 6.89, p = .33, pi = .09$
	31-40	93 (76%)	30 (24%)	
	41-50	149 (81%)	35 (19%)	
	51-60	110 (75%)	36 (25%)	
	61-70	124 (84%)	23 (26%)	
	71-80	66 (80%)	17 (20%)	
	80+	17 (71%)	7 (29%)	
<b>Gender</b>	Male	264 (77%)	77 (23%)	$\chi^2 (1, n = 676) = .001, p = .97, pi = .005$
	Female	258 (77%)	77 (23%)	
<b>Language proficiency</b>	None or very basic English	104 (84%)	20 (16%)	$\chi^2 (2, n = 785) = 2.46, p = .29, pi = .06$
	Adequate English	73 (76%)	23 (24%)	
	Fluent English	442 (78%)	123 (22%)	
<b>Interpreter needed?</b>	No	496 (78%)	138 (22%)	$\chi^2 (1, n = 790) = .58, p = .45, pi = .03$
	Yes	127 (81%)	29 (19%)	
<b>Ethnic group</b>	Asian/Asian British	316 (77%)	95 (23%)	$\chi^2 (4, n = 790) = 5.42, p = .25, pi = .08$
	Black/African/Caribbean/Black British	75 (77%)	22 (23%)	
	Multiple/mixed ethnicity	14 (70%)	6 (30%)	
	White	197 (82%)	43 (18%)	
	Other ethnic group	20 (91%)	2 (9%)	
<b>Type of procedure</b>	Bronchoscopy	4 (100%)	0 (0%)	$\chi^2 (5, n = 787) = 4.64, p = .46, pi = .08$
	ECRP	1 (50%)	1 (50%)	
	Gastroscopy	358 (79%)	94 (21%)	
	Colonoscopy	179 (80%)	45 (20%)	
	Flexible sigmoidoscopy	62 (77%)	19 (23%)	
	Other	16 (67%)	8 (33%)	

**Figure 1: The Audit cycle, based on Benjamin (2008), outlining actions at each stage**



**Figure 2: Audit tool**

Please complete this form at the time of admission. No patient personal identifiable data will be collected

**Date of completion**

*Example*                      05                      September                      2019

**Gender**    Male     Female     Other

**Age**        18-30     31-40     41-50     51-60     61-70     71-80     81+

**ETHNIC GROUP**

**Asian/Asian British**  
 Indian     Pakistani     Bangladeshi     Chinese                       Any other Asian background

**Black / African/ Caribbean / Black British**  
 African     Caribbean                       Any other Black / African / Caribbean background

**Mixed / Multiple Ethnic Groups**  
 White and Black Caribbean     White and Black African     White and Asian   
 Any other mixed or multiple ethnic background


**White**  
 English     Welsh     Scottish     Irish                       Gypsy or Irish Traveller   
 Northern Irish                       European                       Any other White background

**Other ethnic group**  
 Arab     Jewish                       Any other ethnic group

**ATTENDING FOR**

Bronchoscopy                       ERCP                       Gastroscopy   
 Colonoscopy                       Flexible sigmoidoscopy                       Other

**OUTCOME**

Progressed to procedure?  Y     N 

Inadequate preparation  **Select all that apply**  
 Has eaten within preparation period   
 Has not taken preparation liquid   
 To be rebooked for future date

**TRANSLATION NEEDS**

Translator / advocate required	<input type="checkbox"/> Y	<input type="checkbox"/> N	Translator / Advocate available	<input type="checkbox"/> Y	<input type="checkbox"/> N
If required, would the patient prefer the translator to be: (select any that apply)			If available, was the translator: (select one answer)		
A member of hospital / unit staff	<input type="checkbox"/>		A member of hospital / unit staff	<input type="checkbox"/>	
A member of the patient's family or community	<input type="checkbox"/>		A member of the patient's family or community	<input type="checkbox"/>	
Supplied by professional translation service and available in person (face to face)	<input type="checkbox"/>		Supplied by professional translation service	<input type="checkbox"/>	
Supplied by professional translation service and available via telephone	<input type="checkbox"/>		Other (explain below)	<input type="checkbox"/>	
Supplied via professional translation service and available via video-link	<input type="checkbox"/>				

**LANGUAGE NEEDS**

**Does the patient speak English?**

Yes - fluently	<input type="checkbox"/>	Yes – adequately	<input type="checkbox"/>	No – or very basic	<input type="checkbox"/>
<i>The patient can communicate easily with you; it is easy for you to understand them</i>		<i>The patient can communicate with you, but you may need to clarify their meaning</i>		<i>The patient has no or very few English words they can use; you cannot understand each other adequately</i>	

**LANGUAGE: Please select the patient's native or preferred non-English language**

Afrikaans <input type="checkbox"/>	Chinese (Trad) <input type="checkbox"/>	Greek <input type="checkbox"/>	Javanese <input type="checkbox"/>	Malayalam <input type="checkbox"/>	Russian <input type="checkbox"/>	Tajik <input type="checkbox"/>
Albanian <input type="checkbox"/>	Corsican <input type="checkbox"/>	Gujarati <input type="checkbox"/>	Kannada <input type="checkbox"/>	Maltese <input type="checkbox"/>	Samoaan <input type="checkbox"/>	Tamil <input type="checkbox"/>
Amharic <input type="checkbox"/>	Croatian <input type="checkbox"/>	Haitian Creole <input type="checkbox"/>	Kazakh <input type="checkbox"/>	Maori <input type="checkbox"/>	Scots Gaelic <input type="checkbox"/>	Telugu <input type="checkbox"/>
Arabic <input type="checkbox"/>	Czech <input type="checkbox"/>	Hausa <input type="checkbox"/>	Khmer <input type="checkbox"/>	Marathi <input type="checkbox"/>	Serbian <input type="checkbox"/>	Thai <input type="checkbox"/>
Armenian <input type="checkbox"/>	Danish <input type="checkbox"/>	Hawaiian <input type="checkbox"/>	Korean <input type="checkbox"/>	Mongolian <input type="checkbox"/>	Sesotho <input type="checkbox"/>	Turkish <input type="checkbox"/>
Azerbaijani <input type="checkbox"/>	Dutch <input type="checkbox"/>	Hebrew <input type="checkbox"/>	Kurdish <input type="checkbox"/>	Myanmar <input type="checkbox"/>	Shona <input type="checkbox"/>	Ukrainian <input type="checkbox"/>
Basque <input type="checkbox"/>	Esperanto <input type="checkbox"/>	Hindi <input type="checkbox"/>	Kyrgyz <input type="checkbox"/>	Nepali <input type="checkbox"/>	Sindhi <input type="checkbox"/>	Urdu <input type="checkbox"/>
Belarusian <input type="checkbox"/>	Estonian <input type="checkbox"/>	Hmong <input type="checkbox"/>	Lao <input type="checkbox"/>	Norwegian <input type="checkbox"/>	Sinhala <input type="checkbox"/>	Uzbek <input type="checkbox"/>
Bengali <input type="checkbox"/>	Filipino <input type="checkbox"/>	Hungarian <input type="checkbox"/>	Latin <input type="checkbox"/>	Pashto <input type="checkbox"/>	Slovak <input type="checkbox"/>	Vietnamese <input type="checkbox"/>
Bosnian <input type="checkbox"/>	Finnish <input type="checkbox"/>	Icelandic <input type="checkbox"/>	Latvian <input type="checkbox"/>	Persian <input type="checkbox"/>	Slovenian <input type="checkbox"/>	Welsh <input type="checkbox"/>
Bulgarian <input type="checkbox"/>	French <input type="checkbox"/>	Igbo <input type="checkbox"/>	Lithuanian <input type="checkbox"/>	Polish <input type="checkbox"/>	Somali <input type="checkbox"/>	Xhosa <input type="checkbox"/>
Catalan <input type="checkbox"/>	Frisian <input type="checkbox"/>	Indonesian <input type="checkbox"/>	Luxembourgish <input type="checkbox"/>	Portuguese <input type="checkbox"/>	Spanish <input type="checkbox"/>	Yiddish <input type="checkbox"/>
Cebuano <input type="checkbox"/>	Galician <input type="checkbox"/>	Irish <input type="checkbox"/>	Macedonian <input type="checkbox"/>	Punjabi <input type="checkbox"/>	Sudanese <input type="checkbox"/>	Yoruba <input type="checkbox"/>
Chichewa <input type="checkbox"/>	Georgian <input type="checkbox"/>	Italian <input type="checkbox"/>	Malagasy <input type="checkbox"/>	Romanian <input type="checkbox"/>	Swahili <input type="checkbox"/>	Zulu <input type="checkbox"/>
Chinese (Simple) <input type="checkbox"/>	German <input type="checkbox"/>	Japanese <input type="checkbox"/>	Malay <input type="checkbox"/>		Swedish <input type="checkbox"/>	