

# Analysis of the Reliability of the Proposed SRR and STrR Measures (“Inter-Unit Reliability”)

The reliabilities of the Standardized Transfusion Ratio (STrR) and Standardized Readmission Ratio (SRR) were assessed using data among ESRD dialysis patients during 2009-2012. If the measure were a simple average across individuals in the facility, the usual approach for determining measure reliability would be a one-way analysis of variance (ANOVA), in which the between and within facility variation in the measure is determined. The inter-unit reliability (IUR) measures the proportion of the measure variability that is attributable to the between-facility variance. The STTrR and SRR, however, are not simple averages and we instead estimate the IUR using a bootstrap approach, which uses a resampling scheme to estimate the within facility variation that cannot be directly estimated by ANOVA. A small IUR (near 0) reveals that most of the variation of the measures between facilities is driven by random noise, indicating the measure would not be a good characterization of the differences among facilities, whereas a large IUR (near 1) indicates that most of the variation between facilities is due to the real difference between facilities.

## One-Year Standardized Transfusion Ratio (STrR)

The STTrR calculation only included facilities with at least 10 patient years at risk. Overall, we found that IURs for one year STTrR have a range of 0.49-0.55 across the years 2009, 2010, 2011 and 2012, which indicates that around half of the variation in the one-year STTrR can be attributed to the between-facility differences and half to within-facility variation. This value of IUR indicates a **moderate degree of reliability**. When stratified by facility size, we find that, as expected, larger facilities have greater IUR.

**Table 1: IUR for One-year STTrR Overall and by Facility Size, 2009-2012**

Facility Size (Number of patients)	2009		2010		2011		2012	
	IUR	N	IUR	N	IUR	N	IUR	N
All	<b>0.49</b>	4797	<b>0.53</b>	4985	<b>0.55</b>	5117	<b>0.54</b>	5278
Small (<=46)	<b>0.36</b>	1513	<b>0.44</b>	1576	<b>0.38</b>	1706	<b>0.36</b>	1743
Medium (47–78)	<b>0.46</b>	1637	<b>0.49</b>	1682	<b>0.52</b>	1687	<b>0.54</b>	1817
Large (>=79)	<b>0.59</b>	1647	<b>0.6</b>	1727	<b>0.66</b>	1724	<b>0.65</b>	1718

## One-Year Standardized Readmission Ratio (SRR)

The SRR calculation only included facilities with at least 11 discharges. Overall, we found that IURs for one-year SRR have a range of 0.49-0.54 across the years 2009, 2010, 2011 and 2012, which indicates that around half of the variation in the one-year SRR can be attributed to the between-facility differences and half to within-facility variation. This value of IUR indicates a **moderate degree of reliability**. When stratified by facility size, we find that, as expected, larger facilities have greater IUR.

**Table 2: IUR for One-year SRR Overall and by Facility Size, 2009-2012**

Facility Size (Number of patients)	2009 IUR	2009 N	2010 IUR	2010 N	2011 IUR	2011 N	2012 IUR	2012 N
All	<b>0.53</b>	5268	<b>0.54</b>	5469	<b>0.50</b>	5646	<b>0.49</b>	5777
Small (<=46)	<b>0.44</b>	1797	<b>0.45</b>	1859	<b>0.44</b>	1940	<b>0.43</b>	1919
Medium (47-83)	<b>0.51</b>	1749	<b>0.54</b>	1796	<b>0.47</b>	1804	<b>0.45</b>	1919
Large (>=84)	<b>0.58</b>	1722	<b>0.59</b>	1814	<b>0.56</b>	1902	<b>0.54</b>	1939