

ERRATA

To: Recipients of TR-213-CMS, 2005

From: RAND Corporation Publications Department

Date: July 2006 (Please note that this incorporates an Errata from December 2005)

Re: Corrected page (p. iii); updated page (Table of Contents, p. vii); added pages (Appendix B, pp. 65–76)

A paragraph was inadvertently omitted from the Preface. After the first two paragraphs, the following should be added:

For some analyses in this report, we estimated the costs of IRF services provided to Medicare beneficiaries in 2002. To make these estimates, we generally used cost report information in the public use files that matched the date of the beneficiary's discharge (in other words, for a beneficiary discharged June 1, 2002 we used the IRF's cost report that included June 1, 2002, assuming it was available on the file). After this report was completed, but during the public comment period on the proposed rule updating the IRF PPS effective October 1, 2005, HealthSouth, a large chain organization, notified CMS that its IRFs did not include any home office costs in their cost reports for cost reporting periods beginning on or after October 1, 2001 and before October 1, 2003. Home offices of chain organizations such as HealthSouth usually furnish central management and administrative services such as centralized accounting, purchasing, personnel services, management, and other services to support patient care services furnished by its member providers. The reasonable costs of these services are normally included in the provider's cost report and reimbursed as part of the provider's costs. The home office costs for HealthSouth are approximately 13 percent of total costs for its IRFs. The home office costs were included in the cost reports used to estimate 1999 costs for HealthSouth IRFs but were omitted from their cost reports covering 2002 discharges. The HealthSouth hospitals cared for about 19 percent of the cases in our sample hospitals and we estimate that analyses in this report are based on costs per case that were understated by approximately 1.6 percent on average, and by about 6 percent for freestanding IRFs. For further information on this issue, see the IRF PPS final rule (Department of Health and Human Services, Centers for Medicare and Medicaid Services, "Medicare Program; Inpatient Rehabilitation Facility Prospective Payment System for FY 2006; Final Rule," Federal Register, Vol. 70, No. 156, August 15, 2005, p. 47884).

Appendix B was inadvertently omitted from the document. The document has been updated to include the missing Appendix.

We regret the inconvenience.

PREFACE

The Balanced Budget Act (BBA) of 1997 says that the Centers for Medicare and Medicaid Systems (CMS) may set the classification and weighting factors of the Inpatient Rehabilitation Facility (IRF) Prospective Payment System (PPS) so that changes in aggregate payments are a result of real changes in case mix and are not a result of changes in coding. This report covers the RAND Corporation's analysis of the extent to which payments during the first year of the IRF PPS were affected by coding change and by real change in case mix. Implementation of the IRF PPS began January 1, 2002.

For some analyses in this report, we estimated the costs of IRF services provided to Medicare beneficiaries in 2002. To make these estimates, we generally used cost report information in the public use files that matched the date of the beneficiary's discharge (in other words, for a beneficiary discharged June 1, 2002 we used the IRF's cost report that included June 1, 2002, assuming it was available on the file). After this report was completed, but during the public comment period on the proposed rule updating the IRF PPS effective October 1, 2005, HealthSouth, a large chain organization, notified CMS that its IRFs did not include any home office costs in their cost reports for cost reporting periods beginning on or after October 1, 2001 and before October 1, 2003. Home offices of chain organizations such as HealthSouth usually furnish central management and administrative services such as centralized accounting, purchasing, personnel services, management, and other services to support patient care services furnished by its member providers. The reasonable costs of these services are normally included in the provider's cost report and reimbursed as part of the provider's costs. The home office costs for HealthSouth are approximately 13 percent of total costs for its IRFs. The home office costs were included in the cost reports used to estimate 1999 costs for HealthSouth IRFs but were omitted from their cost reports covering 2002 discharges. The HealthSouth hospitals cared for about 19 percent of the cases in our sample hospitals and we estimate that analyses in this report are based on costs per case that were understated by approximately 1.6 percent on

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APPENDIX B: REGRESSION MODELS

Table B.1
Regression of Motor Score

Parameter	COEFFICIENT	t Value	F statistic (where appropriate)
Intercept	35.629	57.62	
race=white	1.935	28.42	
female	0.364	7.54	
age	0.322	18.7	
age squared	-0.003	-24.7	
Number of acute care stays in 6 months prior to IRF admission			189.13
0	-0.760	-4.68	
1	0.000		
2	-1.310	-21.53	
3	-1.251	-14.86	
4 or more	-1.781	-18.93	
Predicted RIC			522.75
1-Stroke	-2.151	-14.02	
2-TBI	-1.388	-4.75	
3-NTBI	-0.463	-1.64	
4-TSCI	-12.461	-15.13	
5-NTSCI	1.055	5.71	
6-Neuro	-2.601	-13.16	
7-Hip FX	-1.561	-10.04	
8-LE Joint	4.608	30.53	
9-Other O.	0.173	0.86	
10-Amp LE	2.552	11.51	
11-Amp Other	1.758	2.94	
12-Osteo Arth	2.743	5.44	
13-Other Arth	0.286	0.47	
14-Cardiac	6.211	32.04	
15-Pulmonary	8.361	31.72	
16-Pain	2.800	4.56	
17-MMT, NBSCI	-2.226	-5.1	
18-MMT, WBSCI	-6.293	-7.16	
19-GB	-2.252	-3.4	
20-Misc.	2.477	14.42	
21-Burns	-1.211	-1	
No prediction	1.663	10.35	
No hospitalization within 30 days (C.G.)	0.000		

(TABLE B.1 CONTINUED)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Predicted tier 1	-2.145	-7.44	
Predicted tier 2	-1.150	-6.08	
Predicted tier 3	-1.421	-8.82	
Predicted tier 1 interacted with predicted RIC			13.85
1-Stroke	-4.505	-10.45	
2-TBI	-5.348	-7.77	
3-NTBI	-4.024	-4.04	
4-TSCI	-7.029	-2.66	
5-NTSCI	-6.026	-8.4	
6-Neuro	-0.856	0.86	
7-Hip FX	-0.968	-1.41	
8-LE Joint	-0.693	-0.82	
9-Other O.	0.750	0.67	
10-Amp LE	0.727	0.78	
11-Amp Other	-2.006	-0.87	
12-Osteo Arth	-4.198	-0.75	
13-Other Arth	-3.903	-1.09	
14-Cardiac	-0.465	-1.07	
15-Pulmonary	-1.673	-1.6	
16-Pain	-7.396	-1.1	
17-MMT, NBSCI	0.652	0.37	
18-MMT, WBSCI	-1.610	-0.65	
19-GB	-1.002	-0.46	
20-Misc.	0.347	0.94	
21-Burns	-6.830	-2.48	
No prediction	0.000	.	
Predicted tier 2 interacted with predicted RIC			3.64
1-Stroke	-0.319	-0.91	
2-TBI	-1.594	-1.88	
3-NTBI	-1.558	-1.79	
4-TSCI	-6.570	-2.16	
5-NTSCI	-2.957	-5.77	
6-Neuro	-1.094	-1.95	
7-Hip FX	-0.472	-1.18	
8-LE Joint	0.133	0.27	
9-Other O.	-0.679	-0.96	
10-Amp LE	-0.730	-2.08	
11-Amp Other	0.684	0.94	
12-Osteo Arth	1.227	0.51	
13-Other Arth	3.133	2.23	
14-Cardiac	-0.720	-1.8	
15-Pulmonary	-1.436	-1.88	

(Table B.1 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
16-Pain	-3.500	-1.26	
17-MMT, NBSCI	-5.336	-2.23	
18-MMT, WBSCI	-6.187	-1.58	
19-GB	2.207	1.35	
20-Misc.	0.087	0.35	
21-Burns	0.598	0.26	
No prediction (C.G.)	0.000	.	
Predicted tier 3 interacted with predicted RIC			7.49
1-Stroke	-0.051	-0.23	
2-TBI	-0.522	-0.93	
3-NTBI	0.543	1.02	
4-TSCI	3.500	1.8	
5-NTSCI	-1.848	-4.88	
6-Neuro	3.017	6.46	
7-Hip FX	0.138	0.5	
8-LE Joint	-0.320	-1.15	
9-Other O.	-0.646	-1.29	
10-Amp LE	-0.946	-3.17	
11-Amp Other	1.663	2.26	
12-Osteo Arth	-1.420	-0.86	
13-Other Arth	1.594	1.05	
14-Cardiac	-1.102	-4.25	
15-Pulmonary	-1.305	-2.14	
16-Pain	2.635	1.47	
17-MMT, NBSCI	0.133	0.1	
18-MMT, WBSCI	1.959	0.69	
19-GB	-0.565	-0.37	
20-Misc.	0.602	2.81	
21-Burns	-0.052	-0.02	
No prediction (C.G.)	0.000	.	
Comorbidities			
Cancer with poor prognosis	0.203	0.88	
Metastatic cancer	-0.531	-2.7	
Chronic renal failure	-0.250	-1.3	
Nutritional deficiencies	-2.665	-17.66	
Dementia	-4.850	-40.59	
Diabetes with organ damage	0.737	5.54	
Peripheral vascular disease	0.586	5.61	
Functional impairment	-5.873	-79.82	
Venous thrombosis or pulmonary embolism (not applicable for PREDRIC 15)	0.295	4.33	
Congestive heart failure	-0.941	-14.07	
Diabetes without organ damage	-0.938	-15.17	

(Table B.1 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Coronary artery disease (not applicable for PREDRIC 14)	0.552	9.05	s
Complications			
Shock or cardiorespiratory arrest	-0.635	-2.67	
Post-op heart attack (AMI)	0.166	0.81	
Venous thrombosis or pulmonary embolism	-1.681	-7.82	
Hip fracture (not applicable for PREDRIC 7)	-2.876	-11.85	
Latrogenic complications	-0.381	-3.17	
Post-op pulmonary compromise	-1.851	-13.1	
Post-op GI hemorrhage or ulceration	-1.475	-6.89	
Cellulitis or decubitus ulcer	-2.827	-20.36	
Pneumonia	-2.698	-21.56	
Mechanical complications due to device or implant	-1.889	-10.62	
Acute renal failure	-1.428	-8.36	
Sentinel event	-1.425	-6.27	
Delirium	-1.272	-7.17	
Stroke (not applicable for PREDRIC 1)	-6.918	-40.9	

Note: Based on 241,306 cases in 1999. R-Square = 0.165

Table B.2
Regression of Equivalent Cases

Parameter	COEFFICIENT	t Value
Intercept	0.9921	4826.93
Predicted transfer to hospital	-0.9290	-562.25
Predicted transfer to SNF/NH	-0.8170	-303.84
Predicted transfer to hospital interacted with LOS relative to RIC statistics		
Min(1, LOS/ median)	0.7872	295.20
Min(1, (LOS - median)/(LOS - 97th percentile))	0.1341	36.13
Indicator that LOS > 97th percentile	0.0018	0.50

(Table B.2 continued)

Parameter	COEFFICIENT	t Value
Predicted transfer to SNF/NH interacted with LOS relative to RIC statistics		
Min(1,LOS/ median)	0.6211	187.83
Min(1, (LOS-median)/(LOS - 97th percentile))	0.2116	100.05
Indicator that LOS > 97th percentile	-0.0141	-7.76

Note: Based on 241,343 cases in 1999. R-Square = 0.739.

Table B.3
Regression of Case Weight

Parameter	Coefficient	t Value	F statistic (where appropriate)
Intercept	1.1333	55.40	
Race (white)	-0.0575	-25.84	
Female	-0.0258	-16.45	
Age	-0.0020	-3.53	
Age squared	0.0000	2.91	
Number of acute care stays in 6 months prior to IRF admission			2.05
0	0.0018	0.33	
1 (Comparison Group (C.G.))	0.0000	.	
2	0.0415	20.67	
3	0.0313	11.24	
4 or more	0.0523	16.82	
Predicted RIC			1707.65
1-Stroke	0.1775	35.03	
2-TBI	0.0871	9.01	
3-NTBI	0.0410	4.39	
4-TSCI	0.4007	14.74	
5-NTSCI	-0.1026	-16.81	
6-Neuro	0.0057	0.88	
7-Hip FX	-0.0911	-17.74	
8-LE Joint	-0.3659	-73.33	
9-Other Orthopedic	-0.1170	-17.62	
10-Amp LE	0.0412	5.63	
11-Amp Other	-0.0157	-0.80	
12-Osteo Arth	-0.2086	-12.55	
13-Other Arth	-0.1400	-6.95	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
14-Cardiac	-0.1927	-30.10	
15-Pulmonary	-0.1501	-17.26	
16-Pain	-0.1465	-7.23	
17-MMT, NBSCI	-0.0311	-2.16	
18-MMT, WBSCI	0.1733	5.99	
19-GB	0.2458	11.26	
20-Misc.	-0.0813	-14.34	
21-Burns	0.1752	4.39	
50-Short stay (<= 3 days)	-0.9371	-7.04	
51-In-hospital death	-1.1097	-2.61	
No prediction	-0.0978	-18.43	
No hospitalization within 30 days (C.G.)	0.0000	.	
Predicted tier 1	0.0846	8.87	
Predicted tier 2	0.0496	7.94	
Predicted tier 3	0.0406	7.63	
Predicted tier 1 interacted with predicted RIC			21.28
1-Stroke	0.1391	9.76	
2-TBI	0.2019	8.86	
3-NTBI	0.1336	4.08	
4-TSCI	0.5213	5.93	
5-NTSCI	0.2649	11.18	
6-Neuro	0.0320	0.97	
7-Hip FX	0.0046	0.20	
8-LE Joint	0.0043	0.16	
9-Other O.	0.0911	2.46	
10-Amp LE	-0.0618	-2.00	
11-Amp Other	0.0753	0.99	
12-Osteo Arth	0.1219	0.66	
13-Other Arth	-0.0421	-0.36	
14-Cardiac	-0.0051	-0.35	
15-Pulmonary	-0.0400	-1.16	
16-Pain	0.0679	0.31	
17-MMT, NBSCI	0.0143	0.25	
18-MMT, WBSCI	0.2543	3.04	
19-GB	0.0929	1.29	
20-Misc.	-0.0362	-2.96	
21-Burns	0.2135	2.36	
No prediction (C.G.)	0.0000	.	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Predicted tier 2 interacted with predicted RIC			6.67
1-Stroke	0.0074	0.64	
2-TBI	0.0501	1.80	
3-NTBI	0.0105	0.37	
4-TSCI	0.5775	5.60	
5-NTSCI	0.1444	8.53	
6-Neuro	-0.0058	-0.32	
7-Hip FX	0.0127	0.96	
8-LE Joint	0.0101	0.62	
9-Other O.	0.0459	1.96	
10-Amp LE	0.0031	0.27	
11-Amp Other	-0.0448	-1.87	
12-Osteo Arth	0.0197	0.25	
13-Other Arth	-0.0021	-0.04	
14-Cardiac	0.0141	1.07	
15-Pulmonary	0.0527	2.09	
16-Pain	-0.0180	-0.20	
17-MMT, NBSCI	0.2703	3.43	
18-MMT, WBSCI	-0.0318	-0.24	
19-GB	0.0432	0.80	
20-Misc.	-0.0048	-0.58	
21-Burns	0.0728	0.97	
No prediction (C.G.)	0.0000	.	
Predicted tier 3 interacted with predicted RIC			11.45
1-Stroke	-0.0421	-5.81	
2-TBI	0.0219	1.18	
3-NTBI	-0.0084	-0.48	
4-TSCI	-0.3172	-4.87	
5-NTSCI	0.0849	6.79	
6-Neuro	-0.0587	-3.81	
7-Hip FX	-0.0200	-2.21	
8-LE Joint	0.0219	2.38	
9-Other O.	0.0126	0.77	
10-Amp LE	-0.0038	-0.38	
11-Amp Other	-0.0668	-2.74	
12-Osteo Arth	0.0890	1.64	
13-Other Arth	-0.0313	-0.62	
14-Cardiac	0.0250	2.92	
15-Pulmonary	-0.0330	-1.64	
16-Pain	-0.1021	-1.71	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
17-MMT, NBSCI	-0.0098	-0.21	
18-MMT, WBSCI	-0.0075	-0.08	
19-GB	0.1555	3.09	
20-Misc.	-0.0310	-4.39	
21-Burns	-0.0564	-0.77	
No prediction (C.G.)	0.0000	.	
SNF/NH on day of discharge	0.0439	19.37	
Acute, LTC, or IRF on day of discharge	-0.3077	-107.60	
Comorbidities			
Cancer with poor prognosis	-0.0126	-1.65	
Metastatic cancer	-0.0029	-0.45	
Delirium	0.0338	5.78	
Chronic renal failure	-0.0014	-0.22	
Nutritional deficiencies	0.0572	11.49	
Dementia	0.0582	14.75	
Diabetes with organ damage	0.0109	2.48	
Peripheral vascular disease	-0.0151	-4.38	
Functional impairment	0.1839	75.55	
Chronic Pulmonary Disease	-0.0210	-9.35	
Congestive heart failure	0.0142	6.45	
Diabetes without organ damage	0.0286	14.03	
Coronary artery disease (not applicable for PREDRIC 14)	-0.0117	-5.81	
Complications			
Shock or cardiorespiratory arrest	0.0251	3.19	
Sentinel event	0.0369	4.91	
Venous thrombosis or pulmonary embolism	0.0410	5.78	
Post-operative GI	0.0356	5.03	
Stroke (not applicable for PREDRIC 1)	0.2949	52.69	
Acute myocardial infarction	0.0035	0.52	
Mechanical complications due to device or implant	0.0416	7.07	
Hip fracture (not applicable for PREDRIC 7)	0.0470	5.87	
Acute renal failure	0.0273	4.84	
Cellulitis or decubitus ulcer	0.0627	13.67	
Iatrogenic complications	0.0021	0.53	
Post-operative pulmonary compromise	0.0684	14.66	
Pneumonia	0.0909	22.00	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Age interacted			3.16
Predicted RIC 50	0.0024	0.61	
Predicted RIC 51	0.0278	2.44	
Other (C.G.)	0.0000	.	
Age squared interacted with			2.87
Predicted RIC 50	0.0000	-0.30	
Predicted RIC 51	-0.0002	-2.38	
Other (C.G.)	0.0000	.	
Number of acute care stays in 6 months prior to IRF admission interacted			1.89
4 or more			
Predicted RIC 50	-0.0404	-1.61	
Predicted RIC 51	-0.0779	-2.17	
Other (C.G.)	0.0000	.	
3 or more			
Predicted RIC 50	-0.0224	-1.00	
Predicted RIC 51	-0.0439	-1.25	
Other (C.G.)	0.0000	.	
2 or more			
Predicted RIC 50	-0.0326	-2.18	
Predicted RIC 51	-0.0102	-0.38	
Other (C.G.)	0.0000	.	
1 or more (C.G.)			
Predicted RIC 50	0.0000	.	
Predicted RIC 51	0.0000	.	
Other	0.0000	.	
none			
Predicted RIC 50	0.0000	0.00	
Predicted RIC 51	0.0971	1.44	
Other (C.G.)	0.0000	.	
Comorbidities interacted			
Cancer with poor prognosis			1.33
Predicted RIC 50	0.0027	0.04	
Predicted RIC 51	0.1041	1.63	
Other (C.G.)	0.0000	.	
Metastatic cancer			4.56
Predicted RIC 50	0.0014	0.03	
Predicted RIC 51	0.1551	3.02	
Other (C.G.)	0.0000	.	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Delirium			1.23
Predicted RIC 50	-0.0492	-1.04	
Predicted RIC 51	0.0881	1.16	
Other (C.G.)	0.0000	.	
Chronic renal failure			2.75
Predicted RIC 50	0.0184	0.36	
Predicted RIC 51	0.1226	2.32	
Other (C.G.)	0.0000	.	
Nutritional deficiencies			0.09
Predicted RIC 50	-0.0158	-0.35	
Predicted RIC 51	0.0103	0.25	
Other (C.G.)	0.0000	.	
Dementia			2.00
Predicted RIC 50	-0.0601	-1.65	
Predicted RIC 51	-0.0607	-1.15	
Other (C.G.)	0.0000	.	
Diabetes with organ damage			1.00
Predicted RIC 50	-0.0090	-0.28	
Predicted RIC 51	0.0618	1.39	
Other (C.G.)	0.0000	.	
Peripheral vascular disease			0.27
Predicted RIC 50	0.0144	0.54	
Predicted RIC 51	-0.0199	-0.48	
Other (C.G.)	0.0000	.	
Functional impairment			51.88
Predicted RIC 50	-0.1810	-8.86	
Predicted RIC 51	-0.1557	-5.11	
Other (C.G.)	0.0000	.	
Chronic Pulmonary Disease			3.02
Predicted RIC 50	0.0229	1.48	
Predicted RIC 51	0.0528	1.98	
Other (C.G.)	0.0000	.	
Congestive heart failure			3.96
Predicted RIC 50	0.0007	0.04	
Predicted RIC 51	-0.0704	-2.81	
Other (C.G.)	0.0000	.	
Diabetes without organ damage			3.97
Predicted RIC 50	-0.0264	-1.70	
Predicted RIC 51	-0.0675	-2.26	
Other (C.G.)	0.0000	.	

(Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Coronary artery disease (not applicable for PREDRIC 14)			0.27
Predicted RIC 50	0.0095	0.70	
Predicted RIC 51	0.0053	0.21	
Other (C.G.)	0.0000	.	
Complications interacted			
Shock or cardiorespiratory arrest interacted			0.28
Predicted RIC 50	-0.0440	-0.70	
Predicted RIC 51	-0.0183	-0.26	
Other (C.G.)	0.0000	.	
Sentinel event interacted			0.68
Predicted RIC 50	-0.0516	-0.99	
Predicted RIC 51	-0.0723	-0.64	
Other (C.G.)	0.0000	.	
Venous thrombosis or pulmonary embolism interacted			0.47
Predicted RIC 50	-0.0371	-0.61	
Predicted RIC 51	-0.0540	-0.76	
Other (C.G.)	0.0000	.	
Post-operative GI interacted			1.12
Predicted RIC 50	0.0052	0.08	
Predicted RIC 51	-0.1123	-1.50	
Other (C.G.)	0.0000	.	
Stroke (not applicable for PREDRIC 1) interacted			49.23
Predicted RIC 50	-0.2901	-6.34	
Predicted RIC 51	-0.4250	-7.71	
Other (C.G.)	0.0000	.	
Acute myocardial infarction interacted			0.98
Predicted RIC 50	-0.0003	-0.01	
Predicted RIC 51	0.0975	1.40	
Other (C.G.)	0.0000	.	
Mechanical complications due to device or implant			0.21
Predicted RIC 50	-0.0318	-0.64	
Predicted RIC 51	-0.0065	-0.09	
Other (C.G.)	0.0000	.	
Hip fracture (not applicable for PREDRIC 7) interacted			2.96
Predicted RIC 50	-0.0331	-0.60	
Predicted RIC 51	-0.1811	-2.37	
Other (C.G.)	0.0000	.	

Table B.3 continued)

Parameter	Coefficient	t Value	F statistic (where appropriate)
Acute renal failure interacted			1.04
Predicted RIC 50	0.0029	0.07	
Predicted RIC 51	-0.0780	-1.44	
Other (C.G.)	0.0000	.	
Cellulitis or decubitus ulcer interacted			1.21
Predicted RIC 50	-0.0614	-1.54	
Predicted RIC 51	-0.0108	-0.23	
Other (C.G.)	0.0000	.	
Iatrogenic complications interacted			1.23
Predicted RIC 50	-0.0058	-0.22	
Predicted RIC 51	-0.0940	-1.55	
Other (C.G.)	0.0000	.	
Post-operative pulmonary compromise interacted			4.85
Predicted RIC 50	-0.0490	-1.36	
Predicted RIC 51	0.1111	2.78	
Other (C.G.)	0.0000	.	
Pneumonia interacted			3.57
Predicted RIC 50	-0.0778	-2.43	
Predicted RIC 51	-0.0423	-1.14	
Other (C.G.)	0.0000	.	

Note: Based on 245,963 cases in 1999. R-Square = 0.342.