Appendix 5

Emergency/Acute Stroke Task Group Economic Decision Analysis Model

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Acute Care Economic Model for the Stroke Task Group

The activities of the Coordinated Stroke Strategy are intended to facilitate the integration of stroke-related service delivery across sites and providers throughout the participating regions. This includes system planning and management, which is the main focus of this analysis. An economic model has been constructed to estimate the costs associated with restructuring acute stroke care delivery in Ontario and primarily supplements the work of the Emergency/Acute Stroke Task Group.

Decision analysis[1,2] was chosen as our primary approach to evaluation, which is characterized by a systematic analysis of evidence to identify viable alternatives and their consequences or outcomes. It forces the analyst to explicitly state these alternatives and outcomes, assign probability estimates and valuations to these outcomes, and identify the optimal alternative to maximize the expected value of the decision.[3,4] The model compares the status quo with two emergency/acute stroke care systems deemed viable by the Emergency/Acute Stroke Task Group, namely the Two- and Three-Level models as previously described. In a decision analysis model, the best estimate of the value for each variable is utilized in the *base-case* or initial analysis, although a range of plausible values could be used, to determine an optimal decision outcome. A cost and outcomes analysis and, if necessary, cost-effectiveness analysis was selected to assess the impact of the newly proposed systems. The primary outcome of interest was one-year mortality, which includes in-hospital mortality. To account for the uncertainty of the best estimates, a range of plausible values further defines the estimate. Sensitivity analysis was used to test whether varying some of the key estimates through the range of plausible values changes the decision outcome.

Only ischaemic stroke and intracerebral hemorrhage were considered in the primary analysis since interventions proposed by the Emergency/Acute Stroke Task Group affect mainly this population. The analysis examined the outcomes and costs associated with stroke care for only one year following hospital admission. The outcomes of interest were defined as in-hospital death, discharge to a chronic care facility (defined as a nursing home or long-term institution), discharge to home or homecare (defined as no subsequent resource utilization, need for homecare, or temporary discharge to a rehabilitation hospital followed by homecare or nursing home placement), recurrent stroke within one year following hospital admission, post-discharge death within one year following hospital admission, or no subsequent sequalae following discharge. The analysis was conducted from the perspective of the provider (i.e. Ontario Ministry of Health (MOH)).

The primary data source of probability estimates was the Canadian Institute of Health Information (CIHI) Discharge Abstract Database, which records discharge information for all hospitalizations from Ontario acute-care hospitals including encrypted patient identifiers (to ensure patient confidentiality), hospital identifiers, in-hospital mortality, diagnostic codes, use of ambulance services, and transfer information. Data supplied by the MOH was also used in assessing costs associated with various outcomes. A cohort of patients admitted to acute care hospitals in Ontario for ischaemic strokes (ICD-9 codes 434 and 436) or intracerebral hemorrhage (ICD-9 code 431) during fiscal year 1997 were used to assess the distribution of patients with respect to diagnosis, initial and transfer hospital type (Level I, II, or III), and one-year outcomes. Hospitals were categorized as Level I, Level II, or Level III hospitals based on a survey conducted by the

MOH. Patients experiencing stroke as a complication of hospital care or those with a history of stroke in the past 5 years were excluded from analysis. It should be noted that subarachnoid hemorrhage was not included in the analysis given differences in the definitions of stroke among the various task groups.

Other factors were also noted to affect the distribution of strokes to the various hospitals. In a two-level model, all potential hospital admissions would first arrive at a Level II or III hospital. It was assumed, however, that only those patients brought by ambulance would directly go to a Level II or II hospital, with an error of 10%. As such, it was assumed that all individuals suffering an ischaemic stroke who were not brought to a Level I hospital by an ambulance in the status quo scenario would still initially present to a Level I hospital. They would then be worked up in the emergency room and immediately transferred to a Level II or III hospital (initial work-up and transport fee was assumed to be approximately $500). Of those originally brought to a Level I hospital by an ambulance in the status quo scenario, 90% would now be taken directly to a Level II or III hospital. Similarly, these assumptions held for individuals suffering from an intracerebral hemorrhage that were originally admitted to a Level I or II hospital in the status quo scenario but should have been admitted to a Level III hospital.

In a three-level model, patients are taken to the nearest hospital, irrespective of level classification. As such, the distribution of patients arriving at the various levels of hospitals for each diagnosis considered remained identical to the status quo. It was, however, assumed that approximately 10% of ischaemic stroke patients brought to a Level I hospital would be eligible for tPA and be transferred to a Level II or III hospital after being worked up in the Level I hospital emergency room. The remainder would be

treated the Level I hospital. For intracerebral hemorrhage patients, it was assumed that 10% of patients brought to a Level I or II hospital would be transported to a Level III hospital following emergency room work-up.

In both two and three- level systems, it is expected that stroke units and use of tPA would result in favorable outcomes. The potential benefits of a stroke unit have been evaluated in a recent meta-analysis[9]. The results suggest the odds ratio for death only is 0.82 with such care, as compared to 0.75 for death or institutionalization, and 0.71 for death or dependency. As a conservative approach, an odds ratio of 0.82 was applied to the outcomes of in-hospital death and discharge to chronic care in the two- and three-level models after adjusting for those individuals originally from the chronic care environment prior to admission. No effect on recurrent stroke was assumed. Although a recent study reported significantly better outcomes associated with stroke unit care[10] (e.g. odds of one-year mortality=0.59 and odds of discharge to a nursing home=0.61) than the meta-analysis, the more conservative estimate was used.

The NINDS trial demonstrated favorable outcomes associated with tPA use on dependency upon discharge in ischaemic stroke patients but no improvement in in-hospital death. The results indicate that tPA patients are 30% more likely to have minimal or no disability following discharge. Given these findings, an odds ratio of 0.77 was applied to the outcome of discharge to chronic care relative to the status quo scenario after adjusting for those individuals originally from the chronic care environment prior to admission. Again, no effect on recurrent stroke was assumed.

Variable costs associated with acute hospitalization, implementation costs for the acute care portion of the strategy, homecare, rehabilitation hospitalization, nursing home

placement, long-term institution placement, recurrent stroke, and tPA administration were derived from various sources. Costs associated with acute hospitalization were estimated using the CIHI database and the resource intensity weight (RIW). The RIW is a measure that assigns a heavier weight of an average cost to patients requiring more resources per day given the complex nature of the case or the longer length of stay. This measure is, however, limited in that it is based on relatively old case-costing data from the United States. In the current system, patients suffering from ischaemic stroke taken to Level I hospitals and those suffering intracerebral hemorrhage taken to a Level I or II hospital typically incur costs associated with an unnecessarily prolonged stay at the respective hospital before being transferred to the appropriate hospital if needed. As such, costs associated with the initial hospital were added to the costs associated with the hospital the patient was transferred to. In the two- and three-level models, it was assumed that hospitals would immediately transfer such patients and a work-up and transfer cost of approximately $500 at the initial institution would be incurred in addition to the costs of the hospital the patient was transferred to.

Approximate costs associated with homecare were based on data from the MOH that examined the proportion of patients with an ICD-9 diagnosis codes of 430-439.9 and their annual costs from fiscal year 1997 with respect to homemaking services, nursing care, physiotherapy, and other services, for an annual total of approximately $4,100. Costs associated with rehabilitation hospitalization were estimated using data from CIHI and the MOH. The average length of stay at a rehabilitation hospital for patients with a diagnosis of TIA, ischaemic stroke, or intracerebral hemorrhage was estimated to be approximately 40 days (mean=43.8, sd=28.1) using the CIHI database. Given MOH data,

a cost of $400/day was assigned, for a total of $16,000. Following rehabilitation, it was assumed 18% of patients age 75 or less and 32% of patients greater than age 75 would require discharge to a nursing home[5,6] and the remainder would require homecare. Once a patient was discharged to a nursing home, it was assumed that they remain there for the rest of the year. The cost associated with nursing home residence was based on a per diem cost of $95.31, as supplied by the MOH, for an annual total of approximately $34,800. Costs associated with a long-term care facility were estimated using an approximate per diem cost of $300/day, as assessed from MOH data, for an annual total of approximately $110,000. For those individuals who died following discharge, half the post-discharge costs were applied, under the assumption that the average death occurred at 6 months. For those experiencing a recurrent stroke following discharge, a recurrent stroke cost estimated at $10,000 was added. Post-discharge costs were not applied those individuals who were originally residing in nursing homes or long-term care facilities prior to admission and returned to the same institutions following discharge.

For the two-level and three-level models, factors associated with tPA administration included acquisition cost, professional fees for administration, and special monitoring, rate, and treatment of intracerebral hemorrhage. The acquisition cost of tissue plasminogen activator (tPA) was derived from the Sunnybrook and Women's College Health Sciences Centre inpatient pharmacy ($2700/100mg). A cost of $2025 was assigned based on an average 75 kg individual and full reimbursement of unused tPA. The costs of administering tPA, special monitoring, and treatment of intracerebral hemorrhage were derived from a study conducted by Fagan et al.[7] A tPA-associated intracerebral hemorrhage rate of 6% was used in the base analysis, which was derived

from the NINDS trial[8]. The establishment of stroke units at Level II and III hospitals was also estimated to reduce the length of stay at these hospitals by 3 days, saving a per diem cost of approximately $350 (MOH estimate).

System costs were also considered and included training of personnel and infrastructure costs associated with implementation of the proposed systems and, in particular, establishment of stroke units. It was assumed that training costs of approximately $80/person would be required for 5,100 attendants, paramedics, and dispatchers for a total annual cost of $0.41 million. It was also assumed that approximately $10,000 would be require annually for each of the 249 hospitals considered in the analysis for training and continuing education purposes, for a total of approximately $2.49 million. For the 62 Level II and II hospitals, specialized services for stroke treatment would require additional personnel in the form of a part-time physician coordinator at $80,000 annually and 2 nurse coordinators at $60,000 each annually, for a total system cost of $12.4 million annually. Overall, the total system cost is estimated to be approximately $15.3 million annually for either a two-level or three-level system. Costs associated with outpatient physician services, drug utilization, and assistive devices were not considered in this analysis.

RESULTS

During fiscal year 1997, 11,376 residents of Ontario were admitted to Ontario acute care hospitals for treatment of ischaemic stroke (n=9,994) or intracerebral hemorrhage (n=1,382). The demographic characteristics of these patients are outlined in

Table 1. A measure of comorbidity using the Charlson comorbidity index[11] was included to estimate the disease burden of patients at the various levels of hospitals.

The base decision model is displayed in Figure 1. The probability and cost estimates used in the base case analysis are outlined in Tables 2 and 3. When the decision tree was rolled back for initial estimates, the results revealed modest cost savings with substantial one-year mortality benefits associated with the two-level system. It is presumed that the lower discharge to highly expensive chronic care institutions in the two-level system outweighed the low cost of premature death of the status quo. Figure 2 displays the cost-related results of the decision model as the average cost per patient for the three alternatives being considered. Based on a sample of 11,376 patients and the assumptions of the model, the average patient currently costs the system approximately $23,892 (status quo estimate). A two-level system would result in a slightly lower cost per patient at $23,733, for total savings of approximately $1.8 million in over one year, assuming a constant number of patients. In the base case analysis, the three-level system is more costly than either the status quo or two-level system, at a variable cost of approximately $24,046 per patient, for a total of approximately $1.8 million over the first year.

These savings are related to several variables in the model. The annual fixed costs for infrastructure were estimated to be approximately $15.3 million. The two-level system was observed to be more costly beyond annual fixed costs of $17 million. Savings are also directly proportional to the volume of patients and may increase if the number of patients increases over time given the lower cost of the two-level system. If the number of patients decreases below 10,500, the two-level system may be more costly than the

status quo, assuming that all other variables are constant. Savings may also decrease if the volume of such patients decreases significantly over time given the fixed annual costs associated with infrastructure. This relationship is outlined in Figure 3. The volume of patients would need to be greater than 12,500 for the three-level system to be less costly than the status quo, assuming all other variables are held constant.

The results of the cost analysis may be highly sensitive to the primary assumptions of the newly proposed systems, namely the lower probability of being discharged to the more costly chronic care environment. The results of one-way sensitivity analyses indicate that as long as the proportion of ischaemic stroke patients treated with tPA remains above 10%, changing the odds of discharge to chronic care institutions associated with tPA administration should not significantly affect the lower cost status of the two-level system. However, overall costs are much more sensitive to the odds of discharge to a chronic care institution associated with stroke units. The results of one-way sensitivity analyses reveal that the two-level system would be more costly if the odds of discharge to chronic care associated with stroke units becomes greater than 0.85. Also, the model appears highly sensitive to the error rate for EMS transport of ischaemic stroke patients (i.e. 10% of patients taken by EMS would inadvertently be taken to Level I hospitals) in the two-level system. One-way sensitivity analysis reveals that if the error rate becomes greater than 17%, the two-level system may be more costly than the status quo if all other variables are held constant. The relationship between the odds of discharge to a chronic care institution and the EMS error rate is outlined in Figure 4.

The outcomes with respect to one-year mortality also favor the two-level system. The results of the decision model using base-case assumptions are outlined in Figure 5. The

estimated one-year mortality associated with the status quo is approximately 33.1%, which translates into 3,765 deaths for patients admitted to acute care hospitals in fiscal year 1997 for treatment of ischaemic stroke or intracerebral hemorrhage. In a two-level system, the one-year mortality rate is expected to be reduced by approximately 6% to 31.2%, resulting in approximately 200 fewer deaths. The adoption of a three-level system would also save lives at a one-year post-admission mortality rate of 32.4%, corresponding to approximately 80 fewer deaths. Although in the two-level system these estimates are insensitive to the EMS error rate and odds of discharge to chronic care institutions associated with stroke units or tPA administration, they are based on the presumed effectiveness of the stroke units on mortality.

The selection of a two-level system reveals a dominant choice as costs are lower and mortality outcomes are favorable relative to the status quo. The three-level system reveals a modestly more expensive system with a slightly favorable mortality outcome relative to the status quo. The marginal cost-effectiveness for the three-level system was estimated to be approximately $22,000 per life saved over a one-year period following hospital admission, a highly favorable result.

A Markov model was constructed to estimate total cost avoidance associated with the newly proposed systems over a 5-year period. Although less reliability can be placed on these estimates given additional assumptions and the extended time horizon involved, a more reasonable picture of the balance between cost avoidance associated with early death and that associated with higher discharge rates to a home environment can be obtained. The assumptions of the model and a more detailed analysis is provided in

Appendix B. Briefly, a two-level system may result in total cost avoidance of approximately $35 million and potentially avoid 460 deaths over a 5-year period relative to the status quo group. These findings may be largely attributable to the significant reduction in discharge to a chronic care environment associated with the two-level system. The chronic care environment not only results in higher incurred costs to the healthcare system, but is also associated with higher mortality. Similarly, the three-level system may also result a cost avoidance relative to the status quo, although less so at $24 million over 5 years and a potential avoidance of 285 deaths. The results for the three-level system may be more sensitive to the proportion of stroke patients attributable to intracerebral hemorrhage. The cost per case for intracerebral hemorrhage is higher in the three-level system relative to the status quo, although the large proportion of ischaemic stroke cases and the relatively lower cost per case for ischaemic stroke result in net cost avoidance.

COMMENTS

The results of this analysis indicate that a two-level system should be favored among the options considered. This option represents a clear choice given its lower cost and favorable mortality profile relative to the status quo. However, feasibility issues such as ability to accommodate increased volume may favor a three-level system. A five-year cost projection was estimated using a Markov model, suggesting favorable outcomes on both cost avoidance and mortality for both the newly proposed systems relative to the status quo. A more confident conclusion, however, may be drawn for the two-level system. The assumptions of the model were perhaps conservative, but highly dependent

on the base model assumptions of intervention effectiveness. Although higher costs may be attributable to the three-level system, a favorable cost-effectiveness ratio suggests that this option may still be worthwhile.

Several limitations of the model must be addressed. The estimates used in the model represent a great deal of uncertainty and should be used be interpreted with caution. Although the estimates represent actual practices based on data from administrative databases, the estimates for the two- and three-level systems are synthesized from the status quo arm and literature-based estimates for the effectiveness of the proposed interventions were used.

The analysis represents only one year of resource utilization and outcome data. The costs associated with chronic care, for example, extend far beyond the initial year after hospitalization and may be a significant component of longer-term total costs. As such, the estimates in this analysis should be viewed as highly conservative estimates, assuming that the effectiveness of the proposed interventions holds true.

Only ischaemic stroke and intracerebral hemorrhage were considered in the model. Of particular interest for prevention measures are transcient ischaemic attacks (TIAs). In fiscal year 1997, 2,630 residents of Ontario were admitted to Ontario acute care hospitals for TIA according to CIHI records. The average cost of hospitalization for these patients was estimated to be $2,800, for a total of approximately $7.4 million. Arguably, the majority of these patients could be more efficiently treated on an out-patient basis and be followed more carefully to prevent future stroke.

The relationship between volume and cost savings deserves further exploration. The Prevention Task Group hopes to reduce the incidence of stroke by approximately

25%. When compared to the number of strokes in fiscal year 1997, this would result in savings of approximately $68 million. Although this potentially would render the two-level system more costly than the status quo given the marginal difference in variable costs and high fixed annual cost, the savings associated with prevention efforts may outweigh these additional costs.

Practical issues such as capacity of Level II and III hospitals to handle increased volume in a two-level model may suggest feasibility issues that the model has not taken into consideration. The effectiveness of the proposed interventions (i.e. tPA for ischaemic stroke patients and stroke units) should be monitored carefully and continuously to assure attainment of the desired endpoint. Given the assumption of an additional 100 patients admitted annually to each of the Level II and III hospitals proposed in the new system and an average length of stay of 10 days, sensitivity analyses may provide some insight. For example, initial sensitivity analyses indicate that 33 Level II and III hospitals with funding for 2 additional beds per hospital may result in a favorable mix for a two-level system when only one-year costs following hospital admission are considered. Furthermore, the effectiveness of the proposed interventions (i.e. tPA for ischaemic stroke patients and stroke units) should be monitored carefully and continuously to assure attainment of the desired endpoint. Such issues may need to be considered beyond the scope of the decision model presented.

The results of this analysis suggest that the two-level system may represent the ideal system of choice for future acute stroke care delivery in Ontario, potentially decreasing costs associated with stroke care and optimizing survival outcomes.

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Figure 1. Demographic characteristics of patients admitted to Ontario acute care hospitals during fiscal year 1997 for treatment of ischaemic stroke or intracerebral hemorhhage.

Fiscal Year 1997

		Level I	Level II	Level III
Number of Hospitals		187	45	17
Number of Patients		3455	5154	2765
Average Number of Cases/Hospital		18	115	163
Intracerebral Hemorrhage				
Number of Patients		195	709	478
% of Patients		0.06	0.14	0.17
Age	Mean (SD)	73.8 (12.3)	72.1 (13.2)	68.0 (13.7)
	Median (IQR)	76 (14)	75 (15)	69 (18)
% Male		0.51	0.49	0.53
Comorbidity Index	Mean (SD)	0.91 (1.57)	0.82 (1.19)	1.10 (1.50)
	Median (IQR)	0 (1)	0 (1)	1 (2)
ISCHAEMIC STROKE				
Number of Patients		3260	4445	2289
% of Patients		0.94	0.86	0.83
Age	Mean (SD)	75.6 (10.9)	74.3 (12.0)	72.4 (12.9)
	Median (IQR)	77 (15)	76 (15)	75 (17)
% Male		0.49	0.47	0.51
Comorbidity Index	Mean (SD)	0.97 (1.32)	1.02 (1.27)	1.37 (1.57)
	Median (IQR)	1 (1)	1 (2)	1 (2)

Table 2. Decision model variable names and descriptions.

Name	Description
cah1lc	cost of Level I ICH hospitalization if patient survives and goes to home/homecare
cahl1a	cost of Level I ICH hospitalization if patient survives and goes to chronic care
cahl1b	cost of Level I ICH hospitalization if patient dies in-hospital
cahl1d	cost of Level I ICH hospitalization if patient gets transferred to a Level III hospital
cahl1e	cost of Level I ISC hospitalization if patient survives and goes to chronic care
cahl1f	cost of Level I ISC hospitalization if patient dies in-hospital
cahl1g	cost of Level I ISC hospitalization if patient survives and goes to home/homecare
cahl1h	cost of Level I ISC hospitalization if patient transferred to Level II or III hospital
cahl1j	cost of ISC hospitalization if Level I patient is transferred to Level II or II hospital and then goes to chronic (2 and 3-tier arms)
cahl1m	cost of ISC hospitalization if Level I patient is transferred to Level II or II hospital and then goes home/homecare (2 and 3-tier arms)
cahl1n	cost of ISC hospitalization if Level I patient is transferred to Level II or II hospital and then dies in-hospital
cahl2a	cost of Level II ICH hospitalization if patient survives and goes to chronic care
cahl2b	cost of Level II ICH hospitalization if patient dies in-hospital
cahl2c	cost of Level II ICH hospitalization if patient survives and goes home/homecare
cahl2d	cost of Level ICH hospitalization if patient goes to Level II and is transferred to Level III
cahl2e	cost of Level II ISC hospitalization if patient survives and goes to chronic care
cahl2f	cost of Level II ISC hospitalization if patient dies in-hospital
cahl2g	cost of Level II ISC hospitalization if patient survives and goes home/homecare
cahl3a	cost of Level III ICH hospitalization if patient survives and goes to chronic care
cahl3b	cost of Level III ICH hospitalization if patient dies in-hospital
cahl3c	cost of Level III ICH hospitalization if patient survives and goes home/homecare
cahl3d	cost of Level III ISC hospitalization if patient survives and goes to chronic care
cahl3e	cost of Level III ISC hospitalization if patient dies in-hospital
cahl3f	cost of Level III ISC hospitalization if patient survives and goes home/homecare
ccc	cost of chronic care for one year following hospitalization
chc	cost of homecare for one year following hospitalization
chospday	cost of one day of hospitalization (general ward)
cnh	cost of nursing home care for one year following hospitalization
crecurstr	cost of recurrent stroke
crehab	cost of rehabilitation hospital care following acute stroke hospitalization
crhday	cost per day at a rehab hospital
csystem	annual fixed cost for infrastructure
ctpa	cost of tPA (acquisition cost)
ctpaadm	cost of tPA adminstration
ctpahem	cost of treating intracerebral hemorrhage as a result of tPA administration
ctpaicu	cost of monitoring associated with tPA use (i.e. special bed and personnel)
ihdead100	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead101	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead102	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead103	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead104	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead105	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead106	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead107	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead108	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead109	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead110	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead111	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead112	probability of in-hospital death during initial hospitalization: discharge to home/homecare

ihdead113	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead114	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead115	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead116	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead117	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead118	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead119	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead120	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead121	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead122	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead25	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead26	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead27	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead28	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead29	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead30	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead31	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead32	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead33	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead34	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead35	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead36	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead37	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead38	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead39	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead40	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead41	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead42	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead43	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead44	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead45	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead46	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead47	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead48	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead49	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead50	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead51	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead52	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead53	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead54	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead55	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead56	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead57	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead58	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead59	probability of in-hospital death during initial hospitalization: on-hospital death
ihdead60	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead61	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead62	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead63	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead64	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead65	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead66	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead67	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead68	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead69	probability of in-hospital death during initial hospitalization: discharge to chronic care

ihdead70	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead71	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead72	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead73	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead74	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead75	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead76	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead77	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead78	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead79	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead80	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead81	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead82	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead83	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead84	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead85	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead86	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead87	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead88	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead89	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead90	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead91	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead92	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead93	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead94	probability of in-hospital death during initial hospitalization: in-hospital death
ihdead95	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead96	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead97	probability of in-hospital death during initial hospitalization: discharge to chronic care
ihdead98	probability of in-hospital death during initial hospitalization: discharge to home/homecare
ihdead99	probability of in-hospital death during initial hospitalization: discharge to home/homecare
p100	3-Tier: proabalilty of tPA eligibility for ISC patients admitted to Level I hospital
p101	3-Tier: proabalilty of tPA eligibility for ISC patients admitted to Level II or III hospital
p102	3-Tier: proabalilty of ICH patient taken to Level I or II hospital
p103	3-Tier: proabalilty of ICH patient transferring to Level III given initial admission to Level I or II hospital
p25	probability of ISC at initial presentation
p26	SQ: probability of admission to Level I hospital given ISC
p27	SQ: probability of no transfer following ISC admission at Level I hospital
p28	SQ: probability of in-hosital survival following ISC admission at Level I hospital
p29	SQ: probability of discharge to chronic care following ISC admission at Level I hospital and in-hospital surv
p30	SQ: probability of recurrent stroke following ISC admission at Level I hospital, in-hospital survival, and discharge to chronic care
p31	SQ: probability of one-year death following ISC admission at Level I hospital, in-hospital survival, and discharge to chronic care
p32	SQ: probability of recurrent stroke following ISC admission at Level I hospital and discharge to home/homecarel
p33	SQ: probability of one-year death following ISC admission at Level I hospital, in-hospital survival, and discharge to home/homecare
p34	SQ: probability of in-hosital survival following ISC admission at Level I hospital and transfer to Level II or II
p35	SQ: probability of discharge to chronic care following ISC admission at Level I hospital and transfer to Leve or III
p36	SQ: probability of recurrent stroke following ISC admission at Level I hospital, transfer to Level II or III, and discharge to chronic care
p37	SQ: probability of one-year death following ISC admission at Level I hospital, transfer to Level II or III, and discharge to chronic care
p38	SQ: probability of recurrent stroke following ISC admission at Level I hospital, transfer to Level II or III, and

	discharge to home/homecare
p39	SQ: probability of one-year death following ISC admission at Level I hospital, transfer to Level II or III, and discharge to home/homecare
p40	SQ: probability of admission to Level II hospital given ISC
p41	SQ: probability of in-hospital survival following ISC admission at Level II hospital
p42	SQ: probability of discharge to chronic care following ISC admission at Level II hospital and in-hospital survival
p43	SQ: probability of recurrent stroke following ISC admission at Level II hospital, in-hospital survival, and discharge to chronic care
p44	SQ: probability of one-year death following ISC admission at Level II hospital, in-hospital survival, and discharge to chronic care
p45	SQ: probability of recurrent stroke following ISC admission at Level II hospital, in-hospital survival, and discharge to home/homecare
p46	SQ: probability of one-year death following ISC admission at Level II hospital, in-hospital survival, and discharge to home/homecare
p47	SQ: probability of in-hospital survival following ISC admission at Level III hospital
p48	SQ: probability of discharge to chronic care following ISC admission at Level III hospital and in-hospital survival
p49	SQ: probability of recurrent stroke following ISC admission at Level III hospital, in-hospital survival, and discharge to chronic care
p50	SQ: probability of one-year death following ISC admission at Level III hospital, in-hospital survival, and discharge to chronic care
p51	SQ: probability of recurrent stroke following ISC admission at Level III hospital, in-hospital survival, and discharge to home/homecare
p52	SQ: probability of one-year death following ISC admission at Level III hospital, in-hospital survival, and discharge to home/homecare
p53	SQ: probability of admission to Level I hospital given ICH
p54	SQ: probability of no transfer following ICH admission to Level I
p55	SQ: probability of in-hospital survival following ICH admission to Level I and no transfer
p56	SQ: probability of discharge to chronic care following ICH admission at Level I hospital and in-hospital surv
p57	SQ: probability of recurrent stroke following ICH admission at Level I hospital, in-hospital survival, and discharge to chronic care
p58	SQ: probability of one-year death following ISC admission at Level I hospital, in-hospital survival, and discharge to chronic care
p59	SQ: probability of recurrent stroke following ISC admission at Level I hospital, in-hospital survival, and discharge to home/homecare
p60	SQ: probability of one-year death following ISC admission at Level I hospital, in-hospital survival, and discharge to home/homecare
p61	SQ: probability of in-hospital survival following ICH initial admission to Level I and subsequent transfer to Level III
p62	SQ: probability of discharge to chronic care following ICH initial admission to Level I, subsequent transfer t Level III, and in-hospital survival
p63	SQ: probability of recurrent stroke following ICH initial admission to Level I, subsequent transfer to Level III and discharge to chronic care
p64	SQ: probability of one-year death following ICH initial admission to Level I, subsequent transfer to Level III, and discharge to chronic care
p65	SQ: probability of recurrent stroke following ICH initial admission to Level I, subsequent transfer to Level III and discharge to home/homecare
p66	SQ: probability of one-year death following ICH initial admission to Level I, subsequent transfer to Level III, and discharge to home/homecare
p67	SQ: probability of admission to Level II hospital given ICH
p68	SQ: probability of no transfer following ICH admission to Level II
p69	SQ: probability of in-hospital survival following ICH admission to Level II and no transfer
p70	SQ: probablility of discharge to chronic care given ICH and admission to Level II hospital
p71	SQ: probability of recurrent stroke following ICH admission at Level II hospital, in-hospital survival, and

	discharge to chronic care
p72	SQ: probability of one-year death following ICH admission at Level II hospital, in-hospital survival, and discharge to chronic care
p73	SQ: probability of recurrent stroke following ICH admission at Level II hospital, in-hospital survival, and discharge to home/homecare
p74	SQ: probability of one-year death following ICH admission at Level II hospital, in-hospital survival, and discharge to home/homecare
p78	proportion of ISC admissions that are walk-ins
p79	proportion of walk-in ISC admissions that walk into Level I
p80	proportion of EMS ISC admissions taken to Level I
p81	2-TIER: proportion of ISC patients inadvertently taken to Level I
p82	2 and 3-TIER: proportion of patients eligible for tPA
p83	2 and 3-TIER: proportion of patients suffering in-hospital death following ISC admission to Level II or III an tPA admin.
p84	2 and 3-TIER: probability of discharge to chronic care following ISC admission to Level II or III, tPA adminsitration, and in-hospital survival
p85	2 and 3-TIER: probability of recurrent stroke following ISC admission to Level II or III, tPA adminsitration, a discharge to chronic care
p86	2 and 3-TIER: probability of recurrent stroke following ISC admission to Level II or III, tPA adminsitration, a discharge to home/homecare
p87	2 and 3-TIER: proportion of patients suffering in-hospital death following admission to Level II or III, and no tPA
p88	2 and 3-TIER: probability of discharge to chronic care following ISC admission to Level II or III, no tPA adminsitration, and in-hospital survival
p89	2 and 3-TIER: probability of recurrent stroke following ISC admission to Level II or III, no tPA, and discharg chronic care
p90	2 and 3-TIER: probability of recurrent stroke following ISC admission to Level II or III, no tPA, and discharg home/homecare
p91	proportion of walk-in ICH admissions that walk into Level I or II
p92	proportion of EMS ICH admissions taken to Level I or II
p93	2-TIER: proportion of ICH patients inadvertently taken to Level I or II
p94	2-TIER:probability of transfer to Level III following ICH admission to Level I or II
p95	2 and 3-TIER:probability of in-hsopital death following ICH admission to Level III
p96	2 and 3-TIER:probability of discharge to chronic care following following ICH admission to Level III
p97	2 and 3-TIER:probability of recurrent stroke following ICH admission to Level III and discharge to chronic
p98	2 and 3-TIER:probability of recurrent stroke following ICH admission to Level III and discharge to home/homecare
p99	proportion of ICH admissions that are walk-ins
pay100	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to home/homecare, a subsequent death
pay101	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, and in-hospital death
pay102	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to chronic care, an recurrent stroke
pay103	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to chronic care, an recurrent stroke
pay104	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to chronic care, an subsequent death
pay105	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to home/homecare and recurrent stroke
pay106	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to home/homecare and no recurrent stroke
pay107	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, discharge to home/homecare and subsequent death
pay108	2 and 3-TIER: total cost for ISC admission to Level II or III, ineligible for tPA, and in-hospital death
pay109	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to chronic care, a

	recurrent stroke
pay110	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to chronic care, a no recurrent stroke
pay111	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to chronic care, a subsequent death
pay112	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to home/homecar and recurrent stroke
pay113	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to home/homecar and no recurrent stroke
pay114	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, discharge to home/homecar and subsequent death
pay115	2 and 3-TIER: total cost for ICH admission to Level I or II, transfer to Level III, and in-hospital death
pay116	2 and 3-TIER: total cost for ICH admission to Level III, discharge to chronic care, and recurrent stroke
pay117	2 and 3-TIER: total cost for ICH admission to Level III, discharge to chronic care, and no recurrent stroke
pay118	2 and 3-TIER: total cost for ICH admission to Level III, discharge to chronic care, and subsequent death
pay119	2 and 3-TIER: total cost for ICH admission to Level III, discharge to home/homecare, and recurrent stroke
pay120	2 and 3-TIER: total cost for ICH admission to Level III, discharge to home/homecare, and no recurrent stro
pay121	2 and 3-TIER: total cost for ICH admission to Level III, discharge to home/homecare, and subsequent dea
pay122	2 and 3-TIER: total cost for ICH admission to Level III and in-hospital death
pay123	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to chronic care, and subsequent stroke
pay124	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to chronic care, and no subsequer stroke
pay125	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to chronic care, and subsequent death
pay126	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to home/homecare, and subseque stroke
pay127	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to home/homecare, and no subsequent stroke
pay128	2 and 3-TIER: total cost for TIA admission to Level I hospital, discharge to home/homecare, and subseque death
pay129	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to chronic care, and subsequ stroke
pay130	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to chronic care, and no subsequent stroke
pay131	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to chronic care, and subsequ death
pay132	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to home/homecare, and subsequent stroke
pay133	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to home/homecare, and no subsequent stroke
pay134	2 and 3-TIER: total cost for TIA admission to Level II or III hospital, discharge to home/homecare, and subsequent death
pay135	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to chronic care, recurrent stroke
pay136	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to chronic care, no recurrent stroke
pay137	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to chronic care, subsequent death
pay138	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to home/homeca and recurrent stroke
pay139	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to home/homeca and no recurrent stroke
pay140	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, discharge to home/homeca and subsequent death

pay141	2 and 3-TIER: total cost for ISC admission to Level I hospital, ineligible for tPA, and in-hospital death
pay142	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge to chronic care, and recurrent stroke
pay143	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge to chronic care, and no recurr stroke
pay144	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge to chronic care, and subsequ death
pay145	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge home/homecare, and recurre stroke
pay146	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge home/homecare, and no recurrent stroke
pay147	2 and 3-TIER: total cost for ICH admission to Level I or II hospital, discharge home/homecare, and subsequent death
pay148	2 and 3-TIER: total cost for ICH admission to Level I or II hospital and in-hospital death
pay25	SQ: total cost for ISC admission to Level I, no transfer, discharge to chronic care, and recurrent stroke
pay26	SQ: total cost for ISC admission to Level I, no transfer, discharge to chronic care, and no subsequent strol
pay27	SQ: total cost for ISC admission to Level I, no transfer, discharge to chronic care, and subsequent death
pay28	SQ: total cost for ISC admission to Level I, no transfer, discharge to home/homecare, and recurrent stroke
pay29	SQ: total cost for ISC admission to Level I, no transfer, discharge to home/homecare, and no subsequent stroke
pay30	SQ: total cost for ISC admission to Level I, no transfer, discharge to home/homecare, and subsequent dea
pay31	SQ: total cost for ISC admission to Level I, no transfer, and in-hospital death
pay32	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to chronic care, and recurre stroke
pay33	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to chronic care, and no subsequent stroke
pay34	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to chronic care, and subseq death
pay35	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to home/homecare, and recurrent stroke
pay36	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to home/homecare, and no subsequent stroke
pay37	SQ: total cost for ISC admission to Level I, transfer to Level II or III, discharge to home/homecare, and subsequent death
pay38	SQ: total cost for ISC admission to Level I, transfer to Level II or III, and in-hospital death
pay39	SQ: total cost for ISC admission to Level II, discharge to chronic care, and recurrent stroke
pay40	SQ: total cost for ISC admission to Level II, discharge to chronic care, and no subsequent stroke
pay41	SQ: total cost for ISC admission to Level II, discharge to chronic care, and subsequent death
pay42	SQ: total cost for ISC admission to Level II, discharge to home/homecare, and recurrent stroke
pay43	SQ: total cost for ISC admission to Level II, discharge to home/homecare, and no recurrent stroke
pay44	SQ: total cost for ISC admission to Level II, discharge to home/homecare, and subsequent death
pay45	SQ: total cost for ISC admission to Level II and in-hospital death
pay46	SQ: total cost for ISC admission to Level III, discharge to chronic care, and recurrent stroke
pay47	SQ: total cost for ISC admission to Level III, discharge to chronic care, and no recurrent stroke
pay48	SQ: total cost for ISC admission to Level III, discharge to chronic care, and subsequent death
pay49	SQ: total cost for ISC admission to Level III, discharge to home/homecare, and recurrent stroke
pay50	SQ: total cost for ISC admission to Level III, discharge to home/homecare, and no recurrent stroke
pay51	SQ: total cost for ISC admission to Level III, discharge to home/homecare, and subsequent death
pay52	SQ: total cost for ISC admission to Level III and in-hospital death
pay53	SQ: total cost for ICH admission to Level I, no transfer, discharge to chronic care, and recurrent stroke
pay54	SQ: total cost for ICH admission to Level I, no transfer, discharge to chronic care, and no recurrent stroke
pay55	SQ: total cost for ICH admission to Level I, no transfer, discharge to chronic care, and subsequent death
pay56	SQ: total cost for ICH admission to Level I, no transfer, discharge to home/homecare, and recurrent stroke
pay57	SQ: total cost for ICH admission to Level I, no transfer, discharge to home/homecare, and no recurrent str
pay58	SQ: total cost for ICH admission to Level I, no transfer, discharge to home/homecare, and subsequent dea

pay59	SQ: total cost for ICH admission to Level I, no transfer, and in-hospital death
pay60	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to chronic care, and recurrent st
pay61	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to chronic care, and no recurrent stroke
pay62	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to chronic care, and subsequent death
pay63	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to home/homecare, and recurrer stroke
pay64	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to home/homecare, and no recurrent stroke
pay65	SQ: total cost for ICH admission to Level I, transfer to Level III, discharge to home/homecare, and subsequ death
pay66	SQ: total cost for ICH admission to Level I, transfer to Level III, in-hospital death
pay67	SQ: total cost for ICH admission to Level II, no transfer, discharge to chronic care, and recurrent stroke
pay68	SQ: total cost for ICH admission to Level II, no transfer, discharge to chronic care, and no recurrent stroke
pay69	SQ: total cost for ICH admission to Level II, no transfer, discharge to chronic care, and subsequent death
pay70	SQ: total cost for ICH admission to Level II, no transfer, discharge to home/homecare, and recurrent strok
pay71	SQ: total cost for ICH admission to Level II, no transfer, discharge to home/homecare, and no recurrent st
pay72	SQ: total cost for ICH admission to Level II, no transfer, discharge to home/homecare, and subsequent de
pay73	SQ: total cost for ICH admission to Level II, no transfer, and in-hospital death
pay74	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to chronic care, and recurrent stroke
pay75	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to chronic care, and no recurren stroke
pay76	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to chronic care, and subsequent death
pay77	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to home/homecare, and recurre stroke
pay78	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to home/homecare, and no recurrent stroke
pay79	SQ: total cost for ICH admission to Level II, transfer to Level III, discharge to home/homecare, and subsequent death
pay80	SQ: total cost for ICH admission to Level II, transfer to Level III, and in-hospital death
pay81	SQ: total cost for ICH admission to Level III, discharge to chronic care, and recurrent stroke
pay82	SQ: total cost for ICH admission to Level III, discharge to chronic care, and no recurrent stroke
pay83	SQ: total cost for ICH admission to Level III, discharge to chronic care, and subsequent death
pay84	SQ: total cost for ICH admission to Level III, discharge to home/homecare, and recurrent stroke
pay85	SQ: total cost for ICH admission to Level III, discharge to home/homecare, and no recurrent stroke
pay86	SQ: total cost for ICH admission to Level III, discharge to home/homecare, and subsequent death
pay87	SQ: total cost for ICH admission to Level III and in-hospital death
pay88	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg chronic care, and recurrent stroke
pay89	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg chronic care, and no recurrent stroke
pay90	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg chronic care, and subsequent death
pay91	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg home/homecare, and recurrent stroke
pay92	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg home/homecare, and no recurrent stroke
pay93	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III, discharg home/homecare, and subsequent death
pay94	2 and 3-TIER: total cost for ISC admission to Level I, eligible for tPA and transfer to Level II or III and in-hospital death
pay95	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to chronic care, and

	recurrent stroke
pay96	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to chronic care, and recurrent stroke
pay97	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to chronic care, and subsequent death
pay98	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to home/homecare, a recurrent stroke
pay99	2 and 3-TIER: total cost for ISC admission to Level II or III, eligible for tPA, discharge to home/homecare, a no recurrent stroke
pcdead	proportion of post-hospital costs incurred prior to death if individual dies following hospitalization
pdc1	probability of going to nursing home following ICH admission to a Level I hospital and discharge to chronic care
pdc10	probability of going to nursing home following ISC admission to a Level I hospital and discharge to chronic care
pdc100	2 and 3-TIER: probability of discharge to nursing home following ISC admission to Level II or III and in-hospital survival
pdc101	2 and 3-TIER: probability of discharge to a chronic care hospital following ISC admission to Level II or III a in-hospital survival
pdc102	2 and 3-TIER: probability of discharge to nursing home following ICH admission to Level III and in-hospital survival
pdc103	2 and 3-TIER: probability of discharge to a chronic care institution following ICH admission to Level III and hospital survival
pdc11	probability of receiving homecare following ISC admission to a Level I hospital and discharge to home/homecare
pdc12	probability of rehab hospitalization following ISC admission to a Level I hospital and discharge to home/homecare
pdc13	probability of going to nursing home following ISC admission to a Level II hospital and discharge to chronic care
pdc14	probability of receiving homecare following ISC admission to a Level II hospital and discharge to home/homecare
pdc15	probability of rehab hospitalization following ISC admission to a Level II hospital and discharge to home/homecare
pdc16	probability of going to nursing home following ISC admission to a Level III hospital and discharge to chroni care
pdc17	probability of receiving homecare following ISC admission to a Level III hospital and discharge to home/homecare
pdc18	probability of rehab hospitalization following ISC admission to a Level III hospital and discharge to home/homecare
pdc2	probability of receiving homecare following ICH admission to a Level I hospital and discharge to home/homecare
pdc3	probability of rehab hospitalization following ICH admission to a Level I hospital and discharge to home/homecare
pdc4	probability of going to nursing home following ICH admission to a Level II hospital and discharge to chronic care
pdc5	probability of receiving homecare following ICH admission to a Level II hospital and discharge to home/homecare
pdc6	probability of rehab hospitalization following ICH admission to a Level II hospital and discharge to home/homecare
pdc7	probability of going to nursing home following ICH admission to a Level III hospital and discharge to chroni care
pdc8	probability of receiving homecare following ICH admission to a Level III hospital and discharge to home/homecare
pdc9	probability of rehab hospitalization following ICH admission to a Level III hospital and discharge to home/homecare
pdc93	probability of going to a nursing home following ISC admission to Level I and subsequent transfer to Level

	or III and discharge to chronic care
pdc94	probability of receiving homecare following ISC admission to Level I and subsequent transfer to Level II or and discharge to home/homecare
pdc95	probability of rehab hospitalization following ISC admission to Level I and subsequent transfer to Level II o and discharge to home/homecare
pnfccich	proportion of ICH patients who were not from a chronic care instiution prior to hospital admission
pnfccisc	proportion of ISC patients who were not from a chronic care instiution prior to hospital admission
pnfnhich	proportion of ICH patients who were not from a nursing home prior to hospital admission
pnfnhisc	proportion of ISC patients who were not from a nursing home prior to hospital admission
pop	number of ISC and ICH patients admitted to acute care hospitals
prho75	proportion of patients requiring rehab following initial hospitalization that are over the age of 75 years
prnho75	proportion of patients over the age of 75 years that may require discharge to a nursing home following reh hospitalization
prnhu75	proportion of patients under the age of 75 years that may require discharge to a nursing home following re hospitalization
psucc	odds of chronic care (institutionalization) following stroke unit care
psudead	odds of death with stroke unit care
psurecur	odds of recurrent stroke given stroke unit care
psutpacc	odds of chronic care (institutionalization) following tpA and stroke unit care
psutpadead	odds of death following tpA adminsitration and stroke unit care
psutparecur	odds of recurrent stroke following tPA and stroke unit care
recur100	probability of recurrent stroke given no recurrent stroke
recur101	probability of recurrent stroke given no recurrent stroke
recur102	probabilty of recurrent stroke given a recurrent stroke occurs
recur103	probability of recurrent stroke given no recurrent stroke
recur104	probability of recurrent stroke given no recurrent stroke
recur105	probabilty of recurrent stroke given a recurrent stroke occurs
recur106	probability of recurrent stroke given no recurrent stroke
recur107	probability of recurrent stroke given no recurrent stroke
recur108	probability of recurrent stroke given no recurrent stroke
recur109	probabilty of recurrent stroke given a recurrent stroke occurs
recur110	probability of recurrent stroke given no recurrent stroke
recur111	probability of recurrent stroke given no recurrent stroke
recur112	probabilty of recurrent stroke given a recurrent stroke occurs
recur113	probability of recurrent stroke given no recurrent stroke
recur114	probability of recurrent stroke given no recurrent stroke
recur115	probability of recurrent stroke given no recurrent stroke
recur116	probabilty of recurrent stroke given a recurrent stroke occurs
recur117	probability of recurrent stroke given no recurrent stroke
recur118	probability of recurrent stroke given no recurrent stroke
recur119	probabilty of recurrent stroke given a recurrent stroke occurs
recur120	probability of recurrent stroke given no recurrent stroke
recur121	probability of recurrent stroke given no recurrent stroke
recur122	probability of recurrent stroke given no recurrent stroke
recur25	probabilty of recurrent stroke given a recurrent stroke occurs
recur26	probability of recurrent stroke given no recurrent stroke
recur27	probability of recurrent stroke given no recurrent stroke
recur28	probabilty of recurrent stroke given a recurrent stroke occurs
recur29	probability of recurrent stroke given no recurrent stroke
recur30	probability of recurrent stroke given no recurrent stroke
recur31	probability of recurrent stroke given no recurrent stroke
recur32	probabilty of recurrent stroke given a recurrent stroke occurs
recur33	probability of recurrent stroke given no recurrent stroke

recur34	probability of recurrent stroke given no recurrent stroke
recur35	probabilty of recurrent stroke given a recurrent stroke occurs
recur36	probability of recurrent stroke given no recurrent stroke
recur37	probability of recurrent stroke given no recurrent stroke
recur38	probability of recurrent stroke given no recurrent stroke
recur39	probabilty of recurrent stroke given a recurrent stroke occurs
recur40	probability of recurrent stroke given no recurrent stroke
recur41	probability of recurrent stroke given no recurrent stroke
recur42	probabilty of recurrent stroke given a recurrent stroke occurs
recur43	probability of recurrent stroke given no recurrent stroke
recur44	probability of recurrent stroke given no recurrent stroke
recur45	probability of recurrent stroke given no recurrent stroke
recur46	probabilty of recurrent stroke given a recurrent stroke occurs
recur47	probability of recurrent stroke given no recurrent stroke
recur48	probability of recurrent stroke given no recurrent stroke
recur49	probabilty of recurrent stroke given a recurrent stroke occurs
recur50	probability of recurrent stroke given no recurrent stroke
recur51	probability of recurrent stroke given no recurrent stroke
recur52	probability of recurrent stroke given no recurrent stroke
recur53	probabilty of recurrent stroke given a recurrent stroke occurs
recur54	probability of recurrent stroke given no recurrent stroke
recur55	probability of recurrent stroke given no recurrent stroke
recur56	probabilty of recurrent stroke given a recurrent stroke occurs
recur57	probability of recurrent stroke given no recurrent stroke
recur58	probability of recurrent stroke given no recurrent stroke
recur59	probability of recurrent stroke given no recurrent stroke
recur60	probabilty of recurrent stroke given a recurrent stroke occurs
recur61	probability of recurrent stroke given no recurrent stroke
recur62	probability of recurrent stroke given no recurrent stroke
recur63	probabilty of recurrent stroke given a recurrent stroke occurs
recur64	probability of recurrent stroke given no recurrent stroke
recur65	probability of recurrent stroke given no recurrent stroke
recur66	probability of recurrent stroke given no recurrent stroke
recur67	probabilty of recurrent stroke given a recurrent stroke occurs
recur68	probability of recurrent stroke given no recurrent stroke
recur69	probability of recurrent stroke given no recurrent stroke
recur70	probabilty of recurrent stroke given a recurrent stroke occurs
recur71	probability of recurrent stroke given no recurrent stroke
recur72	probability of recurrent stroke given no recurrent stroke
recur73	probability of recurrent stroke given no recurrent stroke
recur74	probabilty of recurrent stroke given a recurrent stroke occurs
recur75	probability of recurrent stroke given no recurrent stroke
recur76	probability of recurrent stroke given no recurrent stroke
recur77	probabilty of recurrent stroke given a recurrent stroke occurs
recur78	probability of recurrent stroke given no recurrent stroke
recur79	probability of recurrent stroke given no recurrent stroke
recur80	probability of recurrent stroke given no recurrent stroke
recur81	probabilty of recurrent stroke given a recurrent stroke occurs
recur82	probability of recurrent stroke given no recurrent stroke
recur83	probability of recurrent stroke given no recurrent stroke
recur84	probabilty of recurrent stroke given a recurrent stroke occurs
recur85	probability of recurrent stroke given no recurrent stroke
recur86	probability of recurrent stroke given no recurrent stroke
recur87	probability of recurrent stroke given no recurrent stroke
recur88	probabilty of recurrent stroke given a recurrent stroke occurs

recur89	probability of recurrent stroke given no recurrent stroke
recur90	probability of recurrent stroke given no recurrent stroke
recur91	probabilty of recurrent stroke given a recurrent stroke occurs
recur92	probability of recurrent stroke given no recurrent stroke
recur93	probability of recurrent stroke given no recurrent stroke
recur94	probability of recurrent stroke given no recurrent stroke
recur95	probabilty of recurrent stroke given a recurrent stroke occurs
recur96	probability of recurrent stroke given no recurrent stroke
recur97	probability of recurrent stroke given no recurrent stroke
recur98	probabilty of recurrent stroke given a recurrent stroke occurs
recur99	probability of recurrent stroke given no recurrent stroke
rhlos	average lenghth of stay at rehab hospital
sulosdiff	decrease in acute hospital length of stay as a result of stroke unit implementation (days)
tpahemrate	hemorrhage rate associated with tPA
transfee	cost incurred by transferring hospital for initial work-up and transportation to other hospital (only for transfe
yrdead100	probabilty of one-year death given in-hospital death or post-discharge death
yrdead101	probabilty of one-year death given in-hospital death or post-discharge death
yrdead102	probability of one-year death given in-hospital survival and post-discharge survival
yrdead103	probability of one-year death given in-hospital survival and post-discharge survival
yrdead104	probabilty of one-year death given in-hospital death or post-discharge death
yrdead105	probability of one-year death given in-hospital survival and post-discharge survival
yrdead106	probability of one-year death given in-hospital survival and post-discharge survival
yrdead107	probabilty of one-year death given in-hospital death or post-discharge death
yrdead108	probabilty of one-year death given in-hospital death or post-discharge death
yrdead109	probability of one-year death given in-hospital survival and post-discharge survival
yrdead110	probability of one-year death given in-hospital survival and post-discharge survival
yrdead111	probabilty of one-year death given in-hospital death or post-discharge death
yrdead112	probability of one-year death given in-hospital survival and post-discharge survival
yrdead113	probability of one-year death given in-hospital survival and post-discharge survival
yrdead114	probabilty of one-year death given in-hospital death or post-discharge death
yrdead115	probabilty of one-year death given in-hospital death or post-discharge death
yrdead116	probability of one-year death given in-hospital survival and post-discharge survival
yrdead117	probability of one-year death given in-hospital survival and post-discharge survival
yrdead118	probabilty of one-year death given in-hospital death or post-discharge death
yrdead119	probability of one-year death given in-hospital survival and post-discharge survival
yrdead120	probability of one-year death given in-hospital survival and post-discharge survival
yrdead121	probabilty of one-year death given in-hospital death or post-discharge death
yrdead122	probabilty of one-year death given in-hospital death or post-discharge death
yrdead25	probability of one-year death given in-hospital survival and post-discharge survival
yrdead26	probability of one-year death given in-hospital survival and post-discharge survival
yrdead27	probabilty of one-year death given in-hospital death or post-discharge death
yrdead28	probability of one-year death given in-hospital survival and post-discharge survival
yrdead29	probability of one-year death given in-hospital survival and post-discharge survival
yrdead30	probabilty of one-year death given in-hospital death or post-discharge death
yrdead31	probabilty of one-year death given in-hospital death or post-discharge death
yrdead32	probability of one-year death given in-hospital survival and post-discharge survival
yrdead33	probability of one-year death given in-hospital survival and post-discharge survival
yrdead34	probabilty of one-year death given in-hospital death or post-discharge death
yrdead35	probability of one-year death given in-hospital survival and post-discharge survival
yrdead36	probability of one-year death given in-hospital survival and post-discharge survival
yrdead37	probabilty of one-year death given in-hospital death or post-discharge death
yrdead38	probabilty of one-year death given in-hospital death or post-discharge death
yrdead39	probability of one-year death given in-hospital survival and post-discharge survival
yrdead40	probability of one-year death given in-hospital survival and post-discharge survival
yrdead41	probabilty of one-year death given in-hospital death or post-discharge death

yrdead42	probability of one-year death given in-hospital survival and post-discharge survival
yrdead43	probability of one-year death given in-hospital survival and post-discharge survival
yrdead44	probabilty of one-year death given in-hospital death or post-discharge death
yrdead45	probabilty of one-year death given in-hospital death or post-discharge death
yrdead46	probability of one-year death given in-hospital survival and post-discharge survival
yrdead47	probability of one-year death given in-hospital survival and post-discharge survival
yrdead48	probabilty of one-year death given in-hospital death or post-discharge death
yrdead49	probability of one-year death given in-hospital survival and post-discharge survival
yrdead50	probability of one-year death given in-hospital survival and post-discharge survival
yrdead51	probabilty of one-year death given in-hospital death or post-discharge death
yrdead52	probabilty of one-year death given in-hospital death or post-discharge death
yrdead53	probability of one-year death given in-hospital survival and post-discharge survival
yrdead54	probability of one-year death given in-hospital survival and post-discharge survival
yrdead55	probabilty of one-year death given in-hospital death or post-discharge death
yrdead56	probability of one-year death given in-hospital survival and post-discharge survival
yrdead57	probability of one-year death given in-hospital survival and post-discharge survival
yrdead58	probabilty of one-year death given in-hospital death or post-discharge death
yrdead59	probabilty of one-year death given in-hospital death or post-discharge death
yrdead60	probability of one-year death given in-hospital survival and post-discharge survival
yrdead61	probability of one-year death given in-hospital survival and post-discharge survival
yrdead62	probabilty of one-year death given in-hospital death or post-discharge death
yrdead63	probability of one-year death given in-hospital survival and post-discharge survival
yrdead64	probability of one-year death given in-hospital survival and post-discharge survival
yrdead65	probabilty of one-year death given in-hospital death or post-discharge death
yrdead66	probabilty of one-year death given in-hospital death or post-discharge death
yrdead67	probability of one-year death given in-hospital survival and post-discharge survival
yrdead68	probability of one-year death given in-hospital survival and post-discharge survival
yrdead69	probabilty of one-year death given in-hospital death or post-discharge death
yrdead70	probability of one-year death given in-hospital survival and post-discharge survival
yrdead71	probability of one-year death given in-hospital survival and post-discharge survival
yrdead72	probabilty of one-year death given in-hospital death or post-discharge death
yrdead73	probabilty of one-year death given in-hospital death or post-discharge death
yrdead74	probability of one-year death given in-hospital survival and post-discharge survival
yrdead75	probability of one-year death given in-hospital survival and post-discharge survival
yrdead76	probabilty of one-year death given in-hospital death or post-discharge death
yrdead77	probability of one-year death given in-hospital survival and post-discharge survival
yrdead78	probability of one-year death given in-hospital survival and post-discharge survival
yrdead79	probabilty of one-year death given in-hospital death or post-discharge death
yrdead80	probabilty of one-year death given in-hospital death or post-discharge death
yrdead81	probability of one-year death given in-hospital survival and post-discharge survival
yrdead82	probability of one-year death given in-hospital survival and post-discharge survival
yrdead83	probabilty of one-year death given in-hospital death or post-discharge death
yrdead84	probability of one-year death given in-hospital survival and post-discharge survival
yrdead85	probability of one-year death given in-hospital survival and post-discharge survival
yrdead86	probabilty of one-year death given in-hospital death or post-discharge death
yrdead87	probabilty of one-year death given in-hospital death or post-discharge death
yrdead88	probability of one-year death given in-hospital survival and post-discharge survival
yrdead89	probability of one-year death given in-hospital survival and post-discharge survival
yrdead90	probabilty of one-year death given in-hospital death or post-discharge death
yrdead91	probability of one-year death given in-hospital survival and post-discharge survival
yrdead92	probability of one-year death given in-hospital survival and post-discharge survival
yrdead93	probabilty of one-year death given in-hospital death or post-discharge death
yrdead94	probabilty of one-year death given in-hospital death or post-discharge death
yrdead95	probability of one-year death given in-hospital survival and post-discharge survival
yrdead96	probability of one-year death given in-hospital survival and post-discharge survival

yrdead97	probabilty of one-year death given in-hospital death or post-discharge death
yrdead98	probability of one-year death given in-hospital survival and post-discharge survival
yrdead99	probability of one-year death given in-hospital survival and post-discharge survival

Table 3. Decision model variable formulae and estimates.

Name	Formula
cah1lc	
cahl1a	
cahl1b	
cahl1d	
cahl1e	
cahl1f	
cahl1g	
cahl1h	
cahl1j	
cahl1m	
cahl1n	
cahl2a	
cahl2b	
cahl2c	
cahl2d	
cahl2e	
cahl2f	
cahl2g	
cahl3a	
cahl3b	
cahl3c	
cahl3d	
cahl3e	
cahl3f	
ccc	
chc	
chospday	
cnh	
crecurstr	
crehab	crhday*rhlos+prho75*(prnho75*cnh+(1-prnho75)*chc)+(1-prho75)*(prnhu75*cnh+(1-prnhu75)*chc)
crhday	
csystem	
ctpa	
ctpaadm	
ctpahem	
ctpaicu	
ihdead100	
ihdead101	
ihdead102	
ihdead103	
ihdead104	
ihdead105	
ihdead106	
ihdead107	
ihdead108	
ihdead109	
ihdead110	
ihdead111	
ihdead112	

ihdead113	
ihdead114	
ihdead115	
ihdead116	
ihdead117	
ihdead118	
ihdead119	
ihdead120	
ihdead121	
ihdead122	
ihdead25	
ihdead26	
ihdead27	
ihdead28	
ihdead29	
ihdead30	
ihdead31	
ihdead32	
ihdead33	
ihdead34	
ihdead35	
ihdead36	
ihdead37	
ihdead38	
ihdead39	
ihdead40	
ihdead41	
ihdead42	
ihdead43	
ihdead44	
ihdead45	
ihdead46	
ihdead47	
ihdead48	
ihdead49	
ihdead50	
ihdead51	
ihdead52	
ihdead53	
ihdead54	
ihdead55	
ihdead56	
ihdead57	
ihdead58	
ihdead59	
ihdead60	
ihdead61	
ihdead62	
ihdead63	
ihdead64	
ihdead65	
ihdead66	

ihdead67	
ihdead68	
ihdead69	
ihdead70	
ihdead71	
ihdead72	
ihdead73	
ihdead74	
ihdead75	
ihdead76	
ihdead77	
ihdead78	
ihdead79	
ihdead80	
ihdead81	
ihdead82	
ihdead83	
ihdead84	
ihdead85	
ihdead86	
ihdead87	
ihdead88	
ihdead89	
ihdead90	
ihdead91	
ihdead92	
ihdead93	
ihdead94	
ihdead95	
ihdead96	
ihdead97	
ihdead98	
ihdead99	
p100	
p101	
p102	p53+p67
p103	
p25	
p26	
p27	
p28	
p29	
p30	
p31	
p32	
p33	
p34	
p35	
p36	
p37	
p38	
p39	

p40	
p41	
p42	
p43	
p44	
p45	
p46	
p47	
p48	
p49	
p50	
p51	
p52	
p53	
p54	
p55	
p56	
p57	
p58	
p59	
p60	
p61	
p62	
p63	
p64	
p65	
p66	
p67	
p68	
p69	
p70	
p71	
p72	
p73	
p74	
p78	
p79	
p80	
p81	p78*p79+(1-p78)*p80
p82	
p83	psutpadead*psudead*(1-p34)
p84	pnfnhisc*pdc100*psutpacc+(1-pnfnhisc)*pdc100+pnfccisc*pdc101*psutpacc+(1-pnfccisc)*pdc101
p85	psutparecur*p36
p86	psutparecur*p38
p87	psudead*(1-p34)
p88	pnfnhisc*pdc100*psucc+(1-pnfnhisc)*pdc100+pnfccisc*pdc101*psucc+(1-pnfccisc)*pdc101
p89	psurecur*p36
p90	psurecur*p38
p91	
p92	
p93	p99*p91+(1-p99)*p92
p94	

p95	psudead*(1-p61)
p96	pnfnhich*pdc102*psucc+(1-pnfnhich)*pdc102+pnfccich*pdc103*psucc+(1-pnfccich)*pdc103
p97	psurecur*p63
p98	psurecur*p65
p99	
pay100	cahl1m- chospday*sulosdiff+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pcdead*(pdc94*chc+pdc95*crehab)+
pay101	cahl1n+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+(csystem/pop)
pay102	cahl1j+pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc+crecurstr-sulosdiff*chospday+(csystem/pop)
pay103	cahl1j+pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc-sulosdiff*chospday+(csystem/pop)
pay104	cahl1j+pcdead*(pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc)-sulosdiff*chospday+(csystem/pop)
pay105	cahl1m+pdc94*chc+pdc95*crehab+crecurstr-sulosdiff*chospday+(csystem/pop)
pay106	cahl1m+pdc94*chc+pdc95*crehab-sulosdiff*chospday+(csystem/pop)
pay107	cahl1m+pcdead*(pdc94*chc+pdc95*crehab)-sulosdiff*chospday+(csystem/pop)
pay108	cahl1n+(csystem/pop)
pay109	cahl3a-sulosdiff*chospday+transfee+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc+crecurstr+(csystem/pop
pay110	cahl3a-sulosdiff*chospday+transfee+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc+(csystem/pop)
pay111	cahl3a-sulosdiff*chospday+transfee+pcdead*(pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc)+(csystem/pop
pay112	cahl3c+transfee-sulosdiff*chospday+pdc8*chc+pdc9*crehab+crecurstr+(csystem/pop)
pay113	cahl3c+transfee-sulosdiff*chospday+pdc8*chc+pdc9*crehab+(csystem/pop)
pay114	cahl3c+transfee-sulosdiff*chospday+pcdead*(pdc8*chc+pdc9*crehab)+(csystem/pop)
pay115	pay87+transfee+(csystem/pop)
pay116	pay109-transfee
pay117	pay110-transfee
pay118	pay111-transfee
pay119	pay112-transfee
pay120	pay113-transfee
pay121	pay114-transfee
pay122	pay115-transfee
pay123	pay1+(csystem/pop)
pay124	pay2+(csystem/pop)
pay125	pay3+(csystem/pop)
pay126	pay4+(csystem/pop)
pay127	pay5+(csystem/pop)
pay128	pay6+(csystem/pop)
pay129	pay7+(csystem/pop)
pay130	pay8+(csystem/pop)
pay131	pay9+(csystem/pop)
pay132	pay10+(csystem/pop)
pay133	pay11+(csystem/pop)
pay134	pay12+(csystem/pop)
pay135	pay25+(csystem/pop)
pay136	pay26+(csystem/pop)
pay137	pay27+(csystem/pop)
pay138	pay28+(csystem/pop)
pay139	pay29+(csystem/pop)
pay140	pay30+(csystem/pop)
pay141	pay31+(csystem/pop)
pay142	pay67+(csystem/pop)
pay143	pay68+(csystem/pop)
pay144	pay69+(csystem/pop)
pay145	pay70+(csystem/pop)

pay146	pay71+(csystem/pop)
pay147	pay72+(csystem/pop)
pay148	pay73+(csystem/pop)
pay25	cahl1e+pdc10*pnfnhisc*cnh+(1-pdc10)*pnfccisc*ccc+crecurstr
pay26	cahl1e+pdc10*pnfnhisc*cnh+(1-pdc10)*pnfccisc*ccc
pay27	cahl1e+pcdead*(pdc10*pnfnhisc*cnh+(1-pdc10)*pnfccisc*ccc)
pay28	cahl1g+pdc11*chc+pdc12*crehab+crecurstr
pay29	cahl1g+pdc11*chc+pdc12*crehab
pay30	cahl1g+pcdead*(pdc11*chc+pdc12*crehab)
pay31	cahl1f
pay32	cahl1h+pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc+crecurstr
pay33	cahl1h+pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc
pay34	cahl1h+pcdead*(pdc93*pnfnhisc*cnh+(1-pdc93)*pnfccisc*ccc)
pay35	cahl1h+pdc94*chc+pdc95*crehab+crecurstr
pay36	cahl1h+pdc94*chc+pdc95*crehab
pay37	cahl1h+pcdead*(pdc94*chc+pdc95*crehab)
pay38	cahl1h
pay39	cahl2e+pdc13*pnfnhisc*cnh+(1-pdc13)*pnfccisc*ccc+crecurstr
pay40	cahl2e+pdc13*pnfnhisc*cnh+(1-pdc13)*pnfccisc*ccc
pay41	cahl2e+pcdead*(pdc13*pnfnhisc*cnh+(1-pdc13)*pnfccisc*ccc)
pay42	cahl2g+pdc14*chc+pdc15*crehab+crecurstr
pay43	cahl2g+pdc14*chc+pdc15*crehab
pay44	cahl2g+pcdead*(pdc14*chc+pdc15*crehab)
pay45	cahl2f
pay46	cahl3d+pdc16*pnfnhisc*cnh+(1-pdc16)*pnfccisc*ccc+crecurstr
pay47	cahl3d+pdc16*pnfnhisc*cnh+(1-pdc16)*pnfccisc*ccc
pay48	cahl3d+pcdead*(pdc16*pnfnhisc*cnh+(1-pdc16)*pnfccisc*ccc)
pay49	cahl3f+pdc17*chc+pdc18*crehab+crecurstr
pay50	cahl3f+pdc17*chc+pdc18*crehab
pay51	cahl3f+pcdead*(pdc17*chc+pdc18*crehab)
pay52	cahl3e
pay53	cahl1a+pdc1*pnfnhich*cnh+(1-pdc1)*pnfccich*ccc+crecurstr
pay54	cahl1a+pdc1*pnfnhich*cnh+(1-pdc1)*pnfccich*ccc
pay55	cahl1a+pcdead*(pdc1*pnfnhich*cnh+(1-pdc1)*pnfccich*ccc)
pay56	cah1lc+pdc2*chc+pdc3*crehab+crecurstr
pay57	cah1lc+pdc2*chc+pdc3*crehab
pay58	cah1lc+pcdead*(pdc2*chc+pdc3*crehab)
pay59	cahl1b
pay60	cahl1d+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc+crecurstr
pay61	cahl1d+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc
pay62	cahl1d+pcdead*(pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc)
pay63	cahl1d+pdc8*chc+pdc9*crehab+crecurstr
pay64	cahl1d+pcdead*(pdc8*chc+pdc9*crehab)
pay65	cahl1d+pdc8*chc+pdc9*crehab
pay66	cahl1d
pay67	cahl2a+pdc4*pnfnhich*cnh+(1-pdc4)*pnfccich*ccc+crecurstr
pay68	cahl2a+pdc4*pnfnhich*cnh+(1-pdc4)*pnfccich*ccc
pay69	cahl2a+pcdead*(pdc4*pnfnhich*cnh+(1-pdc4)*pnfccich*ccc)
pay70	cahl2c+pdc5*chc+pdc6*crehab+crecurstr
pay71	cahl2c+pdc5*chc+pdc6*crehab
pay72	cahl2c+pcdead*(pdc5*chc+pdc6*crehab)
pay73	cahl2b

pay74	cahl2d+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc+crecurstr
pay75	cahl2d+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc
pay76	cahl2d+pcdead*(pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc)
pay77	cahl2d+pdc8*chc+pdc9*crehab+crecurstr
pay78	cahl2d+pdc8*chc+pdc9*crehab
pay79	cahl2d+pcdead*(pdc8*chc+pdc9*crehab)
pay80	cahl2d
pay81	cahl3a+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc+crecurstr
pay82	cahl3a+pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc
pay83	cahl3a+pcdead*(pdc7*pnfnhich*cnh+(1-pdc7)*pnfccich*ccc)
pay84	cahl3c+pdc8*chc+pdc9*crehab+crecurstr
pay85	cahl3c+pdc8*chc+pdc9*crehab
pay86	cahl3c+pcdead*(pdc8*chc+pdc9*crehab)
pay87	cahl3b
pay88	cahl1j-chospday*sulosdiff+transfee+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pdc93*pnfnhisc*cnh+ pdc93)*pnfccisc*ccc+crecurstr+(csystem/pop)
pay89	cahl1j-chospday*sulosdiff+transfee+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pdc93*pnfnhisc*cnh+ pdc93)*pnfccisc*ccc+(csystem/pop)
pay90	cahl1j-chospday*sulosdiff+transfee+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pcdead*(pdc93*pnfnl pdc93)*pnfccisc*ccc)+(csystem/pop)
pay91	cahl1m- chospday*sulosdiff+transfee+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pdc94*chc+pdc95*crehab+ tem/pop)
pay92	cahl1m- chospday*sulosdiff+transfee+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pdc94*chc+pdc95*crehab+
pay93	cahl1m- chospday*sulosdiff+transfee+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pcdead*(pdc94*chc+pdc95 tem/pop)
pay94	cahl1m+transfee+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+(csystem/pop)
pay95	cahl1j-chospday*sulosdiff+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pdc93*pnfnhisc*cnh+(1- pdc93)*pnfccisc*ccc+crecurstr+(csystem/pop)
pay96	cahl1j-chospday*sulosdiff+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pdc93*pnfnhisc*cnh+(1- pdc93)*pnfccisc*ccc+(csystem/pop)
pay97	cahl1j-chospday*sulosdiff+ctpaicu+ctpaadm+ctpa+tpahemrate*ctpahem+pcdead*(pdc93*pnfnhisc*cnh+ pdc93)*pnfccisc*ccc)+(csystem/pop)
pay98	cahl1m- chospday*sulosdiff+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pdc94*chc+pdc95*crehab+crecurstr+
pay99	cahl1m-chospday*sulosdiff+ctpa+ctpaicu+ctpaadm+ctpahem*tpahemrate+pdc94*chc+pdc95*crehab+(c
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