

Working with An Actuarial Spreadsheet

3/3/17 UCEN SB Mission Room 3:00 pm



Purpose of today

Define some basic actuarial techniques/vocab Get you exposed to the work

Hopefully by the end of the event, you will feel:

- More prepared to enter the workforce
- Encouraged to participate in the CAL and/or SOA Case comp

Right now: 5 min to meet your teammates

Case Competition Teams

*

CAL 1	Meet Gala	Daniel Rondon	Dorothy Li	John Zhou
CAL 2	James Henderson	David Hoskins	Johnny Trinh	Eileen Zhu
CAL 3	Andrew De Los Santos	Ryo Ichimura	Edwin Wu	Hejia Xu
CAL 4	Josh Urs	Reed Gilbreth	Darius Hsieh	Jordan Jang
CAL 5	Benjamin Ho	Brandon Villadiego	Evelyn Fang	Sam Zhang

SOA	Meet Gala	Stephanie Lee	Daniel Rondon	Richard Qian	Ryo Ichimura



Background Knowledge

Need this before beginning spreadsheet work

Today, covering health case from CAL CC 2016

http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/ 2012/04/CAL-Health-and-Benefit-Question.pdf



H&B actuaries often Analyze past medical trends to Model future claim costs

Losses happen everyday but don't get recorded immediately

Q: Give an example of why it doesn't get recorded immediately

Insurer needs to set aside sufficient funds to pay claims that have already occurred

Reserving



Reserving- estimating the current liability associated with future claim payments

Incurred But not Reported claims- the amount owed by an insurer to all valid claimants who have a covered loss but have not reported it.



2 major sources of uncertainty regarding unpaid claims

Incurred but not enough reported (IBNER)

Estimated claim payments on known claims tend to increase over time until final settled

Incurred but not yet reported (IBNYR)

Question 1

Briefly explain the concept of incurred but not reported (IBNR) losses.



Many different Loss Reserving Methods:

We will be using Loss Development Method

Paid and incurred loss data is sorted into triangle format



Using claims data, construct a loss triangle and estimate IBNR

Creating the key

Given: date incurred, date paid Want: sorting code that uses both Right click Insert col to left Use: =concatenate(incurred date, paid date) Drag down



Make it a table that we can reference later Select data (Shortcut: hold down shift, ctrl, down arrow all at once) In the Insert Tab Table Ok

Rename it



Construct the table

Told: we have data from 1/12 to 3/15 Want: incurred data as rows Paid data as columns

Set up table with every month as a date

Arranging the table

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Filling in the table with paid data

Going to use a vlookup:

=IFNA(VLOOKUP(CONCATENATE(Incurred Date, Paid date), reference table ,4,FALSE),0)

IFNA(_,0) makes it so there aren't error statements

Anchoring tips for this table: \$(incurred Col)(Paid row) (incurred Col)\$(Paidrow)



Table 1																																								
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201304	• •	• •	•			• •	• •				• •	* * ·					99,476,240 1	15,235,600 1	4,292,949	\$ 1,295,296 1	660,401 1	\$ 230,602 \$	300,034 4	90,007	\$ 92,962	\$ \$1,151	\$ 24,264 \$	27,137 \$	57,003 \$	3,203 \$		4,600 \$	3,719 \$				1,796 \$		3,046 \$	
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201309	· ·							- C		- C -					8 C. C. S.		1 (CO)				1 (CO)	13,499,393	16,921,002	9,169,648	\$ 2,210,022	\$ 684,791	321,889 \$	216,729 \$	101,002 8	540,418	49,939 \$	16,841 \$	19,239 \$		39,319 \$	17,070 \$	3,687 \$		4,347 \$. i.i
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Refer to Table 1 in Claims Data tab of

http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/2012/04/ CAL-Health-Data-Solution-Final.xlsx



Development- The difference on successive valuation dates between observed values

I.e. financial activity on claims from the time they occur to the time they are eventually settled and paid

Want to reorganize the data in an actuarial way:

Let's accumulate how much money was paid off within the first month for claim a claim that was incurred in January 2012.

Т	able 1	
	Paid	
Incurred		201201
	201201	\$ 6,662,299

-	Table	e 2		
			Mon	ths of Develop
Month	#	Incurred		1
	1	201201	\$	6,662,299

Let's accumulate how much money was paid off within the first two months for claim a claim that was incurred in January 2012.

Та	ble 1		
	Paid		
Incurred		201201	201202
	201201	\$ 6,662,299	\$ 13,847,527

6,662,299+13,847,527=20,509,826

Та	able 2				
		Mo	nths of Develo	pme	ent
Month #	Incurred		1		2
1	201201	\$	6,662,299	\$	20,509,826

Let's find general formula for all possible months of development for all months of incurred:

Use Sum and use Offset function I.e. first cell =sum(OFFSET(\$H4,0,\$G47):OFFSET(\$H4,0,\$G47+I\$46-1)) Drag

This fills in the rest of the table:

Table 2	\$ 20,509,82	6																																						
	Hunthr of	Developme	at .																																					-
ath 8 Incurred	1	2	3	4	5			7		,	10	11	12	13	14	15	16	17	10	19	20	21	22	23	24	25	24	27	28	29	30	31	32	33	34	35	36	37	38	Ultimate
1 201201	\$ 6,662,29	9 \$ 20,509,8	26 \$ 25,542,6	02 \$ 27,424,	197 \$ 28.8	71,418 \$ 29,27	423 \$ 29.	442,820 \$	29,694,990	\$ 29,601,956	\$ 29,735,42	0 \$ 29,791,46	\$ 29,819,475	\$ 29,834,22	\$ 29,859,719	\$ 29,879,74	\$ 29,815,74	\$ 29,898,931	\$ 29,918,210	\$ 29,918,210	\$ 29,911,219	\$ 29,920,521	\$ 29,921,542	\$ 29,921,542	\$ 29,922,372	\$ 29,922,372	\$ 29,922,655	\$ 29,923,203	\$ 29,922,220	\$ 29,932,220	\$ 29,933,939	\$ 29,933,939	\$ 29,933,939	\$ 29,933,940	\$ 29,932,940	\$ 29,934,128	\$ 29,934,244	\$ 29,934,244 \$	29,936,246	\$ 29,935,245
2 201202	\$ 7,420,72	3 \$ 22,149.5	\$ 26.991.9	49 \$ 28,785.	146 \$ 29.5	0.321 \$ 29.96	223 \$ 30	.113.931 \$	39.315.299	\$ 30,355,434	\$ 30,411,07	\$ 30,455,39	\$ 30,492,890	\$ 30,493,62	\$ 30.511.130	\$ 30,514,471	\$ 30.525.454	\$ 30,621,847	\$ 30,631,872	\$ 30,640,063	\$ 30,640,063	\$ 30,640,063	\$ 30,640,063	\$ 30,640,388	\$ 30,644,139	\$ 30,645,315	\$ 30,645,315	\$ 30,645,773	\$ 30,645,773	\$ 30,645,773	\$ 38,645,773	\$ 30,645,773	\$ 30,645,911	\$ 39,645,911	\$ 30,646,075	\$ 30,646,075	\$ 30,650,753	\$ 30,650,753 \$	30,650,753	\$ 30,650,753
3 201203	\$ 11,230,03	4 \$ 26,751,8	818 \$ 31,766,7	25 \$ 33,067	112 \$ 33.9	4,031 \$ 34,11	460 \$ 34.	370,549 \$	34,579,528	\$ 34,642,685	\$ 34,715,50	\$ 34,849,06	1 \$ 34,901,826	\$ 34,919,25	\$ 34,919,251	\$ 34,946,433	\$ 35,069,731	\$ 35,072,484	\$ 35,074,178	\$ 35,078,788	\$ 35,078,788	\$ 35,088,417	\$ 35,090,626	\$ 35,090,802	\$ 35,090,802	\$ 35,090,802	\$ 35,135,382	\$ 35,135,382	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,638	\$ 35,135,663		
4 201204	\$ 10,411,52	6 \$ 25,553,0	20 \$ 29,019,4	151 \$ 31,106,	746 \$ 31,7	3,147 \$ 32,00	275 \$ 32,	293,456 \$	32,396,653	\$ 32,409,04	\$ 32,539,87	\$ 32,574,02	\$ 32,600,997	\$ 32,658,52	\$ 32,661,765	\$ 32,661,705	\$ 32,666,364	\$ 32,670,060	\$ 32,670,060	\$ 32,670,060	\$ 32,670,060	\$ 32,671,845	\$ 32,671,845	\$ 32,675,667	\$ 32,675,667	\$ 32,676,389	\$ 32,676,213	\$ 32,678,21	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,676,213	\$ 32,682,318	\$ 32,682,318		I	
5 201205	\$ 12,467,16	2 \$ 27,052,7	23 \$ 20,640,6	70 \$ 32,149,	610 \$ 32,8	7,310 \$ 22,40	,700 \$ 22,	\$ \$93,893	22,089,216	\$ 32,929,164	\$ 24,001,60	\$ 24,024,45	1 \$ 34,054,317	\$ 24,010,02	\$ 24,203,545	\$ 24,259,898	\$ 24,284,227	\$ 24,299,176	\$ 34,299,176	\$ 24,204,004	\$ 34,304,749	\$ 24,294,740	\$ 24,329,567	\$ 24,229,567	\$ 24,239,567	\$ 24,249,456	\$ 24,240,456	\$ 24,240,45	\$ 24,349,759	\$ 24,240,710	\$ 24,240,710	\$ 34,340,712	\$ 24,241,145	\$ 24,242,222	\$ 34,342,222	\$ 24,242,222				
6 201206	\$ 12,846,33	\$ \$ 28,239,5	541 \$ 23,250,7	86 \$ 34,934,	\$ 35,6	3,503 \$ 36,18	8,173 \$ 26,	425,174 \$	26,544,453	\$ 36,606,971	\$ 36,606,97	\$ 36,655,58	\$ \$ 36,713,931	\$ 26,753,75	\$ \$ 36,770,905	\$ 36,794,149	\$ 26,802,802	\$ 36,857,422	\$ 36,857,896	\$ 26,857,896	\$ 36,869,518	\$ 36,862,733	\$ 36,880,954	\$ 36,880,954	\$ 26,810,954	\$ 36,888,954	\$ 36,884,803	\$ 26,815,35	\$ 36,888,796	\$ 36,888,796	\$ 25,819,014	\$ 36,889,681	\$ 26,894,865	\$ 36,894,065	\$ 36,894,065				I	
7 201207	\$ 10,801,01	5 \$ 24,851,5	572 \$ 28,823,8	\$9 \$ 30,245,	355 \$ 30,9	3,750 \$ 31,47	,500 \$ 32,	029,476 \$	32,189,953	\$ 32,194,521	\$ 32,386,54	9 \$ 32,436,34	\$ 32,461,982	\$ 32,486,14	\$ \$32,500,444	\$ 32,504,51	\$ 32,543,26	\$ 32,547,432	\$ 32,551,351	\$ 32,551,357	\$ 32,554,079	\$ 32,558,799	\$ 32,566,038	\$ 32,583,447	\$ 32,583,447	\$ 32,583,447	\$ 32,583,580	\$ 32,519,223	\$ 32,589,223	\$ 32,589,339	\$ 32,589,339	\$ 32,596,798	\$ 32,596,798	\$ 32,596,798						
\$ 201208	\$ 12,930,44	2 \$ 28,874,9	976 \$ 32,251,6	Q2 \$ 33,593,	221 \$ 34,1	0,624 \$ 34,55	,332 \$ 34,	764,410 \$	34,983,420	\$ 35,125,955	\$ 35,179,82	\$ \$35,205,925	\$ \$35,225,279	\$ 35,249,54	\$ 35,265,328	\$ 35,266,673	\$ 35,266,673	\$ 35,269,093	\$ 35,279,690	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,282,520	\$ 35,283,739	\$ 35,283,980	\$ 35,283,98	\$ 35,283,980	\$ 35,283,980	\$ 35,287,767	\$ 35,287,767	\$ 35,287,767						I	
9 201209	\$ 12,637,70	7 \$ 20,479,0	102 \$ 33,503,3	29 \$ 35,572,	437 \$ 36,2	13,153 \$ 36,51	4,514 \$ 36,	717,400 \$	36,040,996	\$ 37,038,44	\$ 37,085,19	\$ 37,097,03	\$ 37,115,140	\$ 37,115,14	\$ 37,148,270	\$ 37,164,251	\$ 37,167,336	\$ 37,167,336	\$ 37,171,406	\$ 37,171,006	\$ 37,176,869	\$ 37,170,393	\$ 37,178,393	\$ 37,178,393	\$ 37,170,393	\$ 37,178,560	\$ 37,178,508	\$ 37,189,37	\$ 37,109,377	\$ 37,589,377	\$ 37,109,377	\$ 37,109,661								
10 201210	\$ 12,965,25	\$ \$ 30,735,	181 \$ 35,219,3	16 \$ 37,444,	,623 \$ 29,40	0,840 \$ 28,781	,250 \$ 20,	976,864 \$	29,100,016	\$ 29,140,170	\$ 39,197,45	\$ 29,249,99	\$ 39,280,529	\$ 39,310,78	\$ \$ 29,219,502	\$ 39,330,559	\$ 29,220,559	\$ 29,326,264	\$ 39,337,257	\$ 29,255,121	\$ 29,355,216	\$ 29,274,662	\$ 29,201,103	\$ 39,398,167	\$ 29,299,167	\$ 29,298,167	\$ 39,411,351	\$ 39,411,35	\$ 29,412,964	\$ 39,412,964	\$ 29,419,472								I	
11 201211	\$ 13,546,70	7 \$ 30,353,4	458 \$ 34,081,5	74 \$ 35,348,	,531 \$ 35,9	8,434 \$ 36,47	,488 \$ 37,	\$ \$20,700	37,340,239	\$ 37,441,529	\$ 37,487,22	\$ 37,532,55	\$ 37,555,528	\$ 37,583,89	\$ 37,585,879	\$ 37,619,777	\$ 37,632,966	\$ 37,641,259	\$ 37,643,390	\$ 37,643,390	\$ 37,643,390	\$ 37,643,390	\$ 37,651,215	\$ 37,651,285	\$ 37,651,285	\$ 37,651,215	\$ 37,651,285	\$ 37,651,281	\$ 37,651,285	\$ 37,651,285										
12 201212	\$ 14,835,94	2 \$ 31,683,5	\$ 35,760,8	03 \$ 37,481,	,014 \$ 38,2	1,030 \$ 38,54	3,218 \$ 38	1,861,131 \$	38,960,979	\$ 39,192,881	\$ 39,349,26	1 \$ 39,397,12	\$ \$ 39,499,293	\$ 39,508,18	\$ \$ 39,539,136	\$ 39,550,57	\$ 39,576,375	\$ 39,598,842	\$ 39,590,842	\$ 39,592,998	\$ 39,597,095	\$ 39,597,896	\$ 39,597,096	\$ 39,597,096	\$ 39,597,096	\$ 39,604,194	\$ 39,604,194	\$ 39,684,35	\$ 39,604,359										I	
13 201301	\$ 7,299,32	9 \$ 22,443,2	210 \$ 27,950,4	07 \$ 30,009,	,373 \$ 31,5	3,018 \$ 32,03	,296 \$ 32,	,224,916 \$	32,394,866	\$ 32,479,963	\$ 32,538,46	7 \$ 32,599,79	\$ 32,630,445	\$ 32,646,58	\$ 32,674,483	\$ 32,696,391	\$ 32,762,958	\$ 32,717,391	\$ 32,738,481	\$ 32,738,487	\$ 32,738,487	\$ 32,741,016	\$ 32,742,133	\$ 32,742,133	\$ 32,743,041	\$ 32,743,041	\$ 32,743,351	\$ 32,743,95											I	
14 201302	\$ 0,190,74	5 \$ 24,209,1	120 \$ 29,501,0	10 \$ 31,461,	757 \$ 32,3	0,072 \$ 32,75	,936 \$ 32	,954,980 \$	33,134,192	\$ 33,178,064	\$ 33,230,07	\$ 33,200,404	\$ 33,320,296	\$ 33,329,09	\$ 33,348,232	\$ 33,351,891	\$ 23,243,880	\$ 33,469,244	\$ 33,480,201	\$ 33,419,154	\$ 33,409,154	\$ 33,439,154	\$ 33,419,154	\$ 33,409,509	\$ 33,494,429	\$ 33,494,095	\$ 33,494,895													
15 201303	\$ 11,655,69	1 \$ 27,765,8	\$ 22,998,5	19 \$ 34,320,	469 \$ 35,1	9,110 \$ 25,40	1,401 \$ 25,	673,310 \$	25,890,210	\$ 35,955,76	\$ 26,031,24	2 \$ 26,169,95	\$ 36,224,724	\$ 26,242,81	\$ 26,242,816	\$ 36,271,02	\$ 26,299,992	\$ 36,401,850	\$ 26,492,601	\$ 26,403,292	\$ 36,408,393	\$ 36,419,397	\$ 26,420,680	\$ 36,420,863	\$ 26,420,862	\$ 36,420,863													I	
16 201304	\$ 10,476,24	0 \$ 25,711,8	\$48 \$ 20,004,7	97 \$ 31,300,	,093 \$ 31,9	0,574 \$ 32,19	9,176 \$ 22,	499,210 \$	32,598,017	\$ 32,690,979	\$ 32,742,13	0 \$ 32,776,49	\$ 32,803,631	\$ 32,861,51	\$ 32,864,717	\$ 32,864,71	\$ 32,869,405	\$ 32,873,124	\$ 32,873,124	\$ 32,873,924	\$ 32,873,124	\$ 32,874,920	\$ 32,874,920	\$ 32,878,766	\$ 32,878,766															
11 201305	\$ 12,389,04	9 \$ 28,883,8	594 \$ 39,476,2	21 \$ 31,924,	967 \$ 32,5	8,071 \$ 33,10	,260 \$ 33,	,359,158 \$	33,691,424	\$ 33,702,02	\$ 33,764,02	4 \$ 33,718,71	\$ 33,816,364	\$ 33,849,84	\$ \$3,964,949	\$ 34,020,500	\$ 34,044,768	\$ 34,099,911	\$ 34,059,511	\$ 34,014,305	\$ 34,065,036	\$ 34,065,036	\$ 34,099,620	\$ 34,099,620															I	
18 201306	\$ 13,198,33	1 \$ 28,925,3	381 \$ 34,140,1	\$0 \$ 35,783,	261 \$ 36,5	a'teo \$ 21'or.	058 \$ 37.	309,815 \$	37,431,991	\$ 37,496,035	\$ 37,496,03	\$ \$7,545,82	\$ 37,605,586	\$ 37,646,37	\$ 37,663,941	\$ 37,487,75	\$ 37,696,615	\$ 37,752,562	\$ 37,753,040	\$ 37,753,048	\$ 37,755,734	\$ 37,758,003	\$ 37,776,667																	
19 201307	\$ 10,309,25	4 \$ 23,090,1	193 8 27,471,4	51 \$ 29,036,	324 \$ 29,0	5,202 \$ 30,21	1,c10 \$ 30,	149,126 \$	30,903,900	\$ 10,407,574	\$ 31,072,72	5 5 31,139,72	\$ 31,164,343	\$ 21,107,94	\$ 31,201,261	\$ 31,205,17	\$ 31,242,372	\$ 33,246,376	\$ 31,250,144	\$ 31,250,944	\$ 31,292,797	\$ 31,697,600																	I	
24 241344	\$ 12,021,00	· · · · · · · · · · · · · · · · · · ·	104 5 24,470,4	04 \$ 57,754,	000 0 00/0	0.401 \$ 20,75	1,001 0 00,	262,626	20,9421,090	\$ 31,514,165	5 31,431,17	a an, and the	\$ 31,900,41L	\$ 20 (42 42	> > > 1,123,270	\$ 31,164,97	\$ 30,104,67	\$ 30,161,600	 a 1,130,010 b 30,702,020 	\$ 20,700,740	\$ 31,140,920																		I	
21 201309	\$ 13,476,36	5 \$ 30,419,5	505 \$ 35,105,0	53 \$ 31,775,	000 \$ 30,0	7,406 \$ 37,00	1,671 \$ 37,	210,030 \$	37,347,712	\$ 37,560,700	\$ 37,610,63	5 5 57,623,46.	\$ 37,642,022	\$ 37,042,42	\$ 37,610,200	\$ 37,975,400	\$ 37,670,912		\$ 37,102,720	\$ 35,102,520																			I	
22 241211	. 14 037 30	4 21 420 3	111 4 15 144 4	43 4 34 403	647 4 37.3	4 4 2 4 2 7 7 7 7	643 4 30	412 161 4	20 44 4 644					4 32 614 43		1 30 054 45	* 32 444 473																						I	
24 201312	14 529 02	4 4 31.020 1	105 1 35 021 0	02 \$ 36 705	427 1 37 4	0 334 1 37 74	1057 8 38	057 193 4	38 154 975	0 30 302 074	4 30 535 22	6 30 502 50	0 30 602 153	1 30 640 86	1 1 20 721 172	1 30 732 370	1 30 757 640																							
25 201401	* 7 452 24	7 # 22 941 9		47 \$ 20.676	284 + 22.2	E 120 + 22 74	201 0 22	941 070 .	22 154 797	. 22 201 745	. 22 261 50	22 224 283		. 22 272 10		1 22 422 020																							I	
25 201402	\$ 2.012.07	0 \$ 23,914.5	142 \$ 24 142 4	00 \$ 31078	994 \$ 31.9	7 535 \$ 32 35	623 4 22	513.663 \$	32 731 683	\$ 32 774 422	\$ 32 \$34 43	\$ \$22,283,422	\$ 32 422 826	\$ 32,423,61	\$ 32 442 514																									
27 201403	\$ 11.045.02	2 \$ 26 3110	129 4 31 114 3	45 \$ 32 522	340 4 33 3	5 471 6 33 50	483 4 33	204 304 4	34 009 840	\$ 34 071 451	4 34 143 57	8 8 34 274 43	4 34 326 824	4 34 343 97																									I	
28 201404	\$ 10.052.93	\$ \$ 24,672.9	23 \$ 20.792.4	10 \$ 30.035.	368 \$ 30.6	9.161 \$ 30.09	.122 4 31	186.033 \$	31,280,848	\$ 31,370,054	\$ 31,419,13	\$ 31.452.11	4 \$ 31,478,154																											
29 201405	\$ 12,297.04	1 \$ 26,402.3	102 \$ 20.520.6	21 \$ 21.970.	049 \$ 22.6	4.192 \$ 22.22	.940 \$ 22	407.991 \$	22.699.787	\$ 22,750.457	\$ 22,012,54	9 \$ 22.025.27																											I	
20 201406	\$ 17,199,66	4 \$ 28,996,4	158 \$ 24,244.7	92 \$ 25,871	190 \$ 36.5	8,872 \$ 37.15	0,141 \$ 27.	401,494 \$	37,523,970	\$ 37,510,17	\$ 37,599,17	1																												
31 201407	\$ 11,343,65	4 \$ 26,192,1	140 \$ 30,378,7	04 \$ 31,876.	810 \$ 32.6	5.106 \$ 33.175	.490 \$ 33.	757.241 \$	33,926,375	\$ 33,931,198																													I	
32 201408	\$ 13,609,24	4 \$ 30,370."	711 \$ 33,921.6	37 \$ 35,333.	362 \$ 35.0	0.603 \$ 36.34	207 \$ 36.	565.293 \$	36,795,574																														I	
33 201409	\$ 14,315,24	4 \$ 32,260,2	128 \$ 37,950,5	81 \$ 40,294,	344 \$ 41.0	0,109 \$ 41,34	473 \$ 41	591,328																																
24 201410	\$ 17,271,60	3 \$ 31,461.	161 \$ 26,152,9	45 \$ 28,329,	094 \$ 29.2	0,596 \$ 29,70	,286																																I	
35 201411	\$ 12,849,88	5 \$ 31,032,7	75 \$ 24,844,3	27 \$ 36,139,	639 \$ 36,7	2,192																																		
36 201412	\$ 16,312,51	4 \$ 34,837,0	67 \$ 39,320,1	26 \$ 41,211,	552																																			
37 201501	\$ 7,450,15	1 \$ 22,935,2	\$ 28,563,1	48																																				
38 201502	\$ 8,238,39	9 \$ 24,590,1	144																																					
29 201503	\$ 11,922,19	6																																						

Refer to black portion of table 2 in Claims Data tab of

http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/2012/04/CAL-He alth-Data-Solution-Final.xlsx



Loss development factors- the ratio of losses at successive evaluations for a defined group of claims

Age-to-Age Loss Development Factors

Can check the ratio of successive development years

i.e. What's the ratio between paid claims from $\,$ m1 & m2 that were incurred in

1/2012?

Table	e 2				
		Mon	ths of Develo	pme	nt
Month #	Incurred	8	1		2
1	201201	\$	6,662,299	\$	20,509,826

20,509,826/6,662,299= 3.078491

	Table 3		
			Development Factors
Month	Month #	Incurred	1 to 2
1	1	201201	3.078491



Filled in Table 3

Fill in the rest of table 3 by dragging:

т	able 3																																						
		Development	Fecture																																				
unth unt	th \$ Incurred	1 tu 2	2 tu 3	3 tu 4	4 tu 5	5 tu 6	6 tu 7	7 tu \$	\$ tu 9	9 tu 10	10 to 11	11 ts 12	12 tu 13	13 to 14	14 tu 15	15 tu 16	16 tu 17	17 tu 18	18 tu 19	19 tu 20	20 ta 21	21 ta 22	22 tu 23	23 ta 24	24 tu 25	25 tu 26	26 tu 27	27 tu 2\$	2\$ tu 29	29 tu 30	30 tu 31	31 ta 32	32 tu 33	33 tu 34	34 tu 35 3	35 tu 36	36 tu 37 🔅	37 tu 38 🖇	ta Ultim
1	1 201201	2.078491	1.245384	1.073665	1.052772	1.014962	1.005056	1.005274	1.002627	1.001001	1.001005	1.000940	1.000495	1,000255	1.000671	1.000201	1.000441	1.000645	1.000000	1,000080	1.008077	1.000034	1.008000	1.000028	1,000000	1.000089	1.000010	1.000201	1,000000	1.000057	1.000000	1.000000	1.000000	1.000000	1.000006	1.000004	1.000000	1.000067	1.00000
2	2 201202	2.984821	1.218624	1.066435	1.027624	1.013147	1.004829	1.005687	1.001324	1.001833	1.001490	1.001198	1.000024	1.000574	1,000110	1.000360	1.003158	1.000327	1.000267	1.000080	1.008000	1.000080	1,000011	1.000147	1.000014	1.000000	1.000015	1.000000	1.000000	1.000000	1.000000	1,000005	1,000000	1.000005	1,000000	1.000153	1.000000	1.000000	1.00007
3	3 201203	2.382167	1.105210	1.042905	1.025310	1.006118	1.007595	1.005080	1.001026	1.002102	1.003847	1.001514	1.000499	1.000000	1.000778	1.003528	1.008079	1.000048	1.000131	1.000080	1.000274	1.000063	1.008005	1.000000	1.008000	1.001270	1.000000	1.000007	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000001		
4	4 201204	2.454301	1.166.964	1.043170	1.021102	1.007466	1.089318	1.003040	1.002852	1.001565	1.001050	1.000828	1.001765	1.000097	1.000000	1.000143	1.000113	1.000080	1.000000	1.000080	1.001055	1.000000	1.000117	1.000000	1.001020	1.000058	1.000000	1.000000	1,000000	1.000000	1,000000	1.000000	1.000000	1.000000	1.000126	1.000000			
5	5 201205	2.169918	1.134476	1.047537	1.020457	1.018362	1.005513	1.008761	1.001504	1.001840	1.000672	1.000877	1.000990	1.003389	1.001648	1.000713	1.008433	1.000000	1.000141	1.000021	1.008000	1.001015	1.008000	1.000000	1.008026	1.000000	1.008000	1.000007	1.000000	1.000000	1.000000	1.000013	1.000031	1.000000	1.000000				
	6 201206	2.198256	1.120995	1.047496	1.020205	1.015201	1.006549	1.003275	1.001711	1.000000	1.001328	1.001592	1.001005	1.000467	1.000632	1.000235	1.001484	1.000013	1.000000	1.000071	1.008060	1.000494	1.008000	1.000000	1.000000	1.000104	1.000015	1.000093	1.000000	1.000006	1.000010	1.000119	1.000000	1.000000					
7	7 201207	2.300455	1.159840	1.049317	1.024414	1.015936	1.017536	1.005010	1.000142	1.005343	1.002156	1.000791	1.000744	1.000440	1.000125	1.001192	1.000128	1.000121	1.008000	1.000084	1.000145	1.000222	1.000535	1.000000	1.008000	1.000004	1.000173	1.000000	1.000004	1.000000	1.000229	1.000000	1.000000						
8	8 201208	2.233100	1.116.919	1.041617	1.015997	1.012385	1.006111	1.005298	1.004074	1.001534	1.000742	1.000550	1.000589	1.000448	1.008038	1.000080	1.008069	1.000300	1.008061	1.000000	1.008000	1.000000	1.008000	1.000019	1.001035	1.000007	1.000000	1.000000	1.000000	1.000107	1.000000	1.000000							
9	9 201209	2.253558	1.176389	1.061758	1.018012	1.008322	1.005557	1.003363	1.005362	1.001262	1.000319	1.000488	1.000000	1.000893	1.000430	1.000083	1.000000	1.000110	1.008000	1.000147	1.000041	1.000000	1.000000	1.000000	1.008003	1.000000	1.000293	1.000000	1.000000	1.000000	1.000008								
10	10 201210	2.370562	1.149162	1.060162	1.026338	1.009222	1.084948	1.003385	1.008802	1.001203	1.001548	1.000826	1.000770	1.000222	1.000281	1.000000	1.000148	1.000023	1.000454	1.000085	1.008492	1.000166	1.000431	1.000000	1.008000	1.000335	1.000000	1.000056	1.000000	1.000114									
11	11 201211	2.240652	1.122023	1.037174	1.017254	1.014462	1.016957	1.006555	1.002712	1.001220	1.001209	1.000612	1.000734	1.000074	1.000902	1.000351	1.000220	1.000057	1.008000	1.000080	1.008000	1.000210	1.008000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000										
12	12 201212	2.135595	1.128686	1.048103	1.019744	1.008430	1.083248	1.002569	1.005952	1.003990	1.001216	1.002593	1.000225	1.000783	1.000289	1.000652	1.000366	1.000080	1.001054	1,000104	1.008000	1.000000	1.008000	1.000000	1.000179	1.000000	1.008004	1.000000											
1	13 201301	3.078491	1.245384	1.073665	1.052772	1.014063	1.005056	1.005274	1.002627	1.001001	1.001085	1.000940	1.000495	1.000855	1.000671	1.000201	1.000441	1.0006-45	1.008000	1.000080	1.008077	1.000034	1.008000	1.000028	1.008000	1.000009	1.000018												
2	14 201302	2.984921	1.218624	1.066435	1.027624	1.013147	1.004829	1.005687	1.001324	1.001833	1.001490	1.001198	1.000024	1.000574	1.000110	1.000360	1.003158	1.000327	1.000267	1.000080	1.008000	1.000000	1.000011	1.000147	1.000014	1.000000													
3	15 201303	2.382167	1.115211	1.042905	1.025310	1.006118	1.007595	1.006080	1.001826	1.002102	1.003847	1.001514	1.000499	1.000000	1.000778	1.003528	1.008078	1.000048	1.000131	1.000080	1.000274	1.000063	1.008005	1.000000	1.000000														
4	16 201304	2.454301	1.166964	1.042170	1.021102	1.007466	1.089218	1.003040	1.002852	1.001565	1.001050	1.000828	1.001765	1.000097	1.000000	1.000143	1.000112	1.000080	1.008000	1.000080	1.008055	1.000000	1.000117	1.000080															
5	17 201305	2,169918	1.134476	1.047537	1.020457	1.018362	1.005513	1.008761	1.001504	1.001840	1.000672	1.000877	1.000990	1.003389	1.001648	1.000713	1.008433	1.000080	1.000141	1.000021	1.008000	1.001015	1.008000																
6	10 201306	2.198256	1,120996	1.047496	1.020286	1.015281	1.006549	1.003275	1.001711	1.000000	1.001328	1.001592	1.001085	1.000467	1.000632	1.000235	1.001484	1.000013	1.008000	1.000071	1.008060	1.000494																	
7	19 201307	2.300155	1.159840	1.049317	1.024413	1.015936	1.017526	1.005010	1.000142	1.005343	1.002156	1.000791	1.000744	1.000440	1.000125	1.001192	1.000128	1.000121	1.000000	1.000024	1.000145																		
8	20 201308	2.233100	1.116.919	1.041617	1.015997	1.012385	1.006111	1.006298	1.004074	1.001534	1.000742	1.000550	1.008689	1.000448	1.008038	1.000080	1.008069	1.000300	1.008061	1.000080																			
	21 201309	2.252550	1.176209	1.061758	1.010012	1.008322	1.005557	1.003363	1.005362	1.001262	1.000319	1.000488	1.000000	1.000893	1.000430	1.000083	1.008000	1.000110	1.008000																				
10	22 201310	2.370562	1.149162	1.060162	1.026338	1.009222	1.084948	1.003385	1.000302	1.001203	1.001548	1.000826	1.000770	1.000222	1.000281	1,000000	1.000148	1.000023																					
11	23 201311	2.240652	1.122823	1.037174	1.017254	1.014463	1.016957	1.006555	1.002713	1.001220	1.001209	1.000612	1.000734	1.000074	1.000902	1.000351	1.000220																						
12	24 201312	2.135595	1.128686	1.048103	1.019744	1.008430	1.088248	1.002569	1.005952	1.003990	1.001216	1.002593	1.000225	1.000783	1.000289	1.000652																							
1	25 201401	3.078491	1.245384	1.073665	1.052772	1.014063	1.005856	1.005274	1.002627	1.001801	1.001885	1.000940	1.008495	1.000855	1.001671																								
2	26 201402	2.994921	1.218624	1.066435	1.027624	1.012147	1.084929	1.005697	1.001324	1.001022	1.001490	1,001198	1.000024	1,000574																									
3	27 201403	2.382167	1.115211	1.042905	1.025310	1.006118	1.007595	1.005080	1.001826	1.002102	1.003847	1.001514	1.008499																										
4	28 201404	2.454301	1.166964	1.043170	1.021102	1.007466	1.089318	1.003040	1.002852	1.001565	1.001050	1.000828																											
5	29 201405	2.169918	1.134476	1.047537	1.020457	1.018362	1.005513	1.008761	1.001504	1.001840	1.000672																												
6	30 201406	2.198256	1.120996	1.047496	1.020286	1.015281	1.016549	1.003275	1.001711	1.000000																													
7	21 201407	2.300155	1.159840	1.049317	1.024413	1.015936	1.017526	1.005010	1.000142																														
*	32 201403	2.233100	1.116.919	1.041617	1.015997	1.012385	1.006111	1.006298																															
•	33 201409	2.253550	1.176389	1.061758	1.018012	1.008322	1.005557																																
10	34 201410	2.370562	1.149162	1.060162	1.026338	1.009222																																	
11	35 201411	2.240652	1.122823	1.037174	1.017254																																		
12	26 201412	2.135595	1.1286.86	1.048103																																			
1	37 201501	3.078491	1.245384																																				
2	38 201502	2.984821																																					
3	29 201503																																						

Refer to black portion of table 3 in Claims Data tab of

http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/2012/04/CAL-Healt h-Data-Solution-Final.xlsx

Modeling future loss development

Can average past age-to-age development factors to model the loss development

i.e. averaging all of the development factors for 1 to 2 months from incurred 1/2012-2/2015 can give us an estimate of development factor for 1 to 2 months for 3/2015

		Table 5		
				Development Factor
N	lonth	Month #	Incurred	1 to 2
	1	1	201201	3.078491
	2	2	201202	2.984821
	3	3	201203	2.382167
	4	4	201204	2.454301
	5	5	201205	2.169918
	6	6	201206	2.198256
	7	7	201207	2.300855
	8	8	201208	2.233100
	9	9	201209	2.253558
	10	10	201210	2.370562
	11	11	201211	2.240652
	12	12	201212	2.135595
	1	13	201301	3.078491
	2	14	201302	2.984821
	3	15	201303	2.382167
	4	16	201304	2.454301
	5	17	201305	2.169918
	6	18	201306	2.198256
	7	19	201307	2.300855
	8	20	201308	2.233100
	9	21	201309	2.253558
	10	22	201310	2.370562
	11	23	201311	2.240652
	12	24	201312	2.135595
	1	25	201401	3.078491
	2	26	201402	2.984821
	3	27	201403	2.382167
	4	28	201404	2.454301
	5	29	201405	2.169918
	6	30	201406	2.198256
	7	31	201407	2.300855
	8	32	201408	2.233100
	9	33	201409	2.253558
	10	34	201410	2.370562
	11	35	201411	2.240652
	12	36	201412	2.135595
	1	37	201501	3.078491
	2	38	201502	2.984821
	3	39	201503	2.433425

Filled in Table 3 (red)

Fill in the rest of Table 3 by dragging:

	Table 3																																						
14		Developmen	t Fecturz																																				_
Hanth .	ath \$ Incurre	4 1ts 2	2 t = 3	3 t= 4	4 ta 5	5 tu 6	6 tu 7	7 tu #	8 ta 9	9 ta 10	10 tu 11	11 to 12	12 to 13	13 to 14	14 to 15	15 tu 14	16 ts 17	17 ts 18	18 ta 19	19 ta 20	20 ta 21	21 ta 22	22 tu 23	23 ts 24	24 tu 25	25 tu 26	26 ts 27	27 tu 28	28 ta 29	29 tu 30	30 tu 31	31 ts 32	32 ts 33	33 tu 34	34 ta 35	35 tu 34	34 ta 37	37 ta 38 8 1	ta Ultimata
1	1 20120	1 3.078491	1.245384	1.073665	1.052772	1.014063	1.005056	1.005274	1.082627	1.001001	1.001005	1.000940	1.000495	1.000055	1.080671	1.080201	1.000441	1.000545	1.000000	1.000000	1.001077	1.000034	1.000000	1.010028	1.000800	1.000305	1.000010	1.000301	1.000080	1.080057	1.010000	1.000800	1.000300	1.000000	1.008005	1.0000014	1.000000	1.010067	1.000000
2	2 20120	2 2.904021	1,210624	1.066425	1.027624	1.013147	1.004029	1.006607	1.001224	1.001032	1.001490	1.001191	1.000024	1.000574	1.080110	1.080260	1.003150	1.000327	1.000267	1.000000	1.008000	1.000080	1.000011	1.000147	1.000914	1.000300	1.001015	1.001000	1.000080	1.000000	1.010000	1.000805	1.000300	1.000005	1.008000	1.000153	1.000000	1.010000	1.000000
3	3 20120	3 2.292167	1.105210	1.042905	1.025310	1.006119	1.007595	1.006000	1.001826	1.002102	1.092847	1.001514	1.000499	1.000000	1.000778	1.003520	1.080879	1.000848	1.000121	1.000000	1.000274	1.000063	1.000005	1,010000	1.000800	1.001270	1.000000	1.008007	1.000080	1.000000	1,010000	1,000800	1.000000	1.000000	1.008000	1.000000	1,080001	1.080032	1,000800
4	4 20120	4 2.454301	1.166964	1.043170	1.021102	1.007466	1.089218	1.002040	1.002852	1.001565	1.001050	1.000828	1.001765	1.008097	1.000080	1.010143	1.000112	1,000100	1,000000	1.000000	1.001055	1.000080	1.000117	1,010000	1.000020	1.000952	1.000000	1.008000	1.000080	1.000000	1,080800	1,000800	1.000300	1.000000	1.000125	1.000000	1.000000	1.010033	1,000000
5	5 20120	5 2.169918	1.134476	1.047537	1.020457	1.018362	1.015513	1.008761	1.001504	1.001840	1.000672	1.000377	1.000990	1.003389	1.001648	1.010713	1.010433	1.000100	1.000141	1.001021	1.008000	1.001015	1.000000	1.010000	1.000826	1,000000	1.000000	1.001007	1.000080	1.000000	1.010000	1.000013	1.000031	1.000000	1.000000	1.000039	1.000080	1.080833	1.000800
6	6 20120	6 2.198256	1.180996	1.047495	1.020285	1.015281	1.006549	1.003275	1.001711	1.030800	1.001328	1.001592	1.001085	1.008467	1.000632	1.080235	1.001434	1.000013	1,000000	1.001071	1.008060	1.000494	1.000000	1.010000	1.000800	1.000104	1.001015	1.001093	1.000080	1.000006	1.000018	1,000119	1.000000	1.000000	1.001026	1.000039	1.000000	1.080033	1.000000
7	7 20120	2.300155	1.159840	1.049317	1.024414	1.015936	1.017536	1.005010	1.010142	1.005343	1.002156	1.000791	1.000744	1.008440	1.080125	1.001192	1.000128	1.000121	1,000000	1.000084	1.000145	1.000222	1.010535	1.010000	1.000800	1.000304	1.000173	1.001000	1.000004	1.000000	1.010229	1.000800	1.000000	1.000001	1.008026	1.000039	1.000000	1.080833	1.000800
8	8 20120	\$ 2.233100	1.116-919	1.041617	1.015997	1.012315	1.006111	1.006298	1.084074	1.001534	1.000742	1.000550	1.0006.09	1.008448	1.000038	1.080030	1.080869	1.000300	1.000061	1.000000	1.008000	1.000080	1.000000	1.000019	1.000835	1.000307	1.000000	1.001000	1.000080	1.010107	1.010000	1.000800	1.000304	1.008001	1.008026	1.000039	1.000000	1.080033	1.000800
,	9 20120	2.253558	1.176309	1.061758	1.011012	1.008322	1.065557	1.003363	1.085362	1.001262	1.000319	1.000488	1.000000	1.000093	1.000430	1.080033	1.020200	1.000110	1.000000	1.000147	1.000041	1.000080	1.000000	1.010000	1.000803	1.000300	1.000293	1.001000	1.000080	1.000000	1.010008	1.000817	1.000004	1.000001	1.008026	1.000039	1.000000	1.080633	1.000000
10	50 20121	2.370562	1.149162	1.060162	1.026330	1.009222	1.004940	1.002205	1.080892	1.001200	1.001540	1.000326	1.000770	1.000222	1.080281	1.000000	1.000140	1.000023	1.000454	1.000005	1.008492	1.000166	1.010431	1,010000	1.000800	1.000335	1.000000	1.008066	1.000080	1.010114	1.080020	1.000817	1.000304	1.000001	1.008026	1.008029	1.000000	1.080033	1.020200
11	11 20121	1 2.240652	1.122923	1.037174	1.017254	1.014463	1.016957	1.006555	1.092712	1.001220	1.001209	1.000612	1.000724	1.008074	1.000902	1.080351	1.080220	1.000857	1,000000	1.000000	1.008000	1.000210	1.000000	1,020000	1.000800	1.000300	1.000000	1.008000	1.000080	1.000029	1.080028	1,000917	1.000304	1.008001	1.008026	1.000029	1.000000	1.080032	1.030800
12	12 20121	2 2.135595	1.122525	1.048103	1.019744	1.003430	1.089249	1.002569	1.085952	1.003590	1.001216	1/02593	1.000225	1.000783	1.000289	1.080652	1.080266	1,000800	1.000054	1.000104	1.008000	1.000080	1,000000	1,080800	1,000179	1,000000	1.000004	1.008000	1.000080	1.000029	1,080828	1.000917	1,000204	1,000001	1.008025	1.000039	1.000000	1.080032	1,000000
1	13 20130	1 3.078491	1.245384	1.073665	1.052772	1.014063	1.005856	1.005274	1.082627	1.001001	1.001085	1,000940	1,000495	1.000+\$55	1,000671	1.080201	1.000441	1.000545	1,000000	1.000000	1.001077	1.000034	1.000000	1.010028	1.000100	1,000009	1.008018	1.008040	1.000080	1.000029	1.080828	1,000017	1,000004	1.000001	1.008026	1.000039	1.000080	1.080033	1.000000
2	14 20130	2 2.984821	1.218624	1.066435	1.027624	1.013147	1.004829	1.006587	1.001324	1.001833	1.001490	1.001198	1.000024	1.000574	1.010110	1.010350	1.003158	1.000327	1.000267	1.000000	1.008000	1.000080	1.000011	1.000147	1.000014	1.000000	1.001041	1.001040	1.000080	1.000029	1.080628	1.000817	1.000004	1.000001	1.008026	1.000039	1.000000	1.080033	1.000000
3	15 20130	3 2.382167	1.185218	1.042905	1.025310	1.016113	1.007595	1.006080	1.001826	1.002102	1.003847	1.001514	1.000499	1.008000	1.000778	1.083528	1.010078	1.000848	1.000131	1.000000	1.000274	1.000063	1.010005	1.010000	1.000100	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000917	1.000304	1.000001	1.008026	1.000039	1.000000	1.080833	1.000100
4	16 20130	4 2.454301	1.166964	1.043170	1.021102	1.007466	1.089318	1.003040	1.082852	1.001565	1.001050	1.000328	1.001765	1.001097	1.000010	1.080143	1.000113	1.000100	1.000308	1.000000	1.001055	1.000080	1.000117	1.010000	1.000919	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000017	1.000304	1.000001	1.008026	1.000039	1.000000	1.080833	1.000000
5	17 20130	5 2.169918	1.134476	1.047537	1.020457	1.010362	1.015513	1.008761	1.001504	1.001840	1.000572	1.000377	1.000990	1.003389	1.001648	1.010713	1.010433	1.000800	1.000141	1.001021	1.001000	1.001015	1.000000	1.010823	1.000319	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000817	1.000304	1.000001	1.008026	1.000039	1.000000	1.080833	1.000000
	10 20130	6 2.190256	1.100996	1.047495	1.020206	1.015201	1.006549	1.003275	1.001711	1.030500	1.001320	1.001592	1.001005	1.008467	1.000632	1.080235	1.001404	1.000913	1.000300	1.001071	1.000060	1.000494	1.000072	1.080823	1.000919	1.000120	1.001041	1.008040	1.000080	1.000029	1.080828	1.000917	1.000304	1.000001	1.008026	1.000039	1.000000	1.080033	1,020200
7	19 20130	2.200155	1.159240	1.049317	1.024413	1.015936	1.017536	1.005010	1.080542	1.095242	1.002156	1.000791	1.000744	1.002440	1.000125	1.001192	1.000128	1.000121	1,000000	1.000084	1.000145	1.000212	1.000072	1.080822	1.000819	1,000120	1.000041	1.000040	1.000080	1.000029	1.080028	1.000917	1.000304	1.008001	1.008026	1.000029	1.000000	1.080032	1.020200
8	20 20130	\$ 2.232100	1.116919	1.041617	1.015997	1.012315	1.006111	1.006298	1,084074	1.001534	1.000742	1,000550	1,0006.09	1.008448	1.000038	1.000000	1,080869	1.000300	1.000061	1.000000	1.008092	1.000212	1.000072	1.080022	1.000919	1,000128	1.008041	1.008040	1.000080	1.000029	1,080828	1,000917	1,000204	1.000001	1.008025	1.000029	1.000000	1.080032	1,000000
,	21 20130	2.253558	1.176389	1.061758	1.011012	1.008322	1.005557	1.003363	1.015262	1.001262	1.000319	1.000488	1.000000	1.000893	1.000430	1.010033	1.000000	1.000110	1.000000	1.000020	1.001092	1.000212	1.000072	1.010023	1.000919	1.000128	1.001041	1.001040	1.000080	1.000029	1.080028	1,000817	1.000004	1.000001	1.008026	1.000039	1.000000	1.080033	1.000800
59	22 20131	2.370562	1.149162	1.060162	1.026338	1.009222	1.004940	1.003385	1.080892	1.001208	1.001548	1.000326	1.000770	1.000222	1.000281	1.000000	1.000148	1.000023	1.000081	1.000030	1.001092	1.000212	1.000072	1.010023	1.000019	1.000128	1.001041	1.001040	1.000080	1.000029	1.010028	1.000017	1.000004	1.000001	1.001026	1.000039	1.000000	1.080033	1.000100
11	23 20131	1 2.240652	1.122823	1.037174	1.017254	1.014463	1.016957	1.006555	1.002713	1.001220	1.001209	1.000612	1.000734	1.000074	1.000902	1.010351	1.080220	1.000147	1.000081	1.000030	1.001092	1.000212	1.000072	1.010823	1.000019	1.000128	1.001041	1.001040	1.000000	1.080629	1.010028	1.000917	1.000304	1.000001	1.008028	1.000039	1.000000	1.080833	1.000100
12	24 20131	2 2.135595	1.128686	1.048103	1.019744	1.003430	1.063248	1.002569	1.085952	1.003990	1.001216	1.002593	1.000225	1.000783	1.000289	1.080652	1.000561	1.000147	1.000081	1.000030	1.001092	1.000212	1.000072	1.010823	1.000019	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000017	1.000304	1.000001	1.000026	1.000039	1.000000	1.080833	1.000100
1	25 20140	1 3.078491	1.245384	1.073665	1.052772	1.014063	1.005856	1.005274	1.082627	1.001001	1.001085	1.000940	1.000495	1.000055	1.000671	1.010621	1.000561	1.000147	1.000081	1.000030	1.001012	1.000212	1.000072	1.010823	1.000319	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000917	1.000304	1.000001	1.008026	1.000039	1.000000	1.010033	1.000800
2	26 20140	2 2.904021	1.210624	1.064435	1.027624	1.013147	1.004829	1.0066.07	1.001324	1.001033	1.001490	1.001193	1.000024	1.000574	1.000499	1.080621	1.000561	1.000147	1.000001	1.000030	1.001012	1.000212	1.000072	1.080023	1.000919	1.000120	1.001041	1.001040	1.000000	1.000029	1.080628	1.000917	1.000304	1.008001	1.008026	1.000039	1.000000	1.080833	1.020200
2	27 20140	2.292167	1.105210	1.042905	1.025310	1,086119	1.007595	1.006000	1.001026	1.002102	1.002847	1.001514	1.000499	1.008689	1.000499	1.080621	1,000561	1.000147	1.000001	1.000020	1.001092	1.000212	1.000072	1.080022	1.000819	1.000120	1.001041	1.001040	1.000080	1.000029	1.080028	1.000917	1.000304	1.008001	1.008026	1.000039	1.000000	1.080032	1.030800
4	28 20140	4 2.454301	1.166964	1.043170	1.021102	1.007466	1,089218	1.002040	1.002052	1.001565	1,001050	1,000228	1,000622	1.008689	1.000499	1.080621	1.000561	1,000147	1,000081	1,000020	1.001092	1.000212	1.080072	1.080822	1,000019	1,000128	1.001041	1.008040	1.000080	1.000029	1.080028	1,000917	1,000304	1,000001	1.008026	1.000029	1.000000	1.080033	1,000800
5	29 20140	5 2.169918	1.134476	1.047527	1.020457	1.018362	1.085513	1,008761	1.001504	1.001840	1.000572	1,001075	1,000622	1.008689	1.000499	1,080621	1.000561	1,000147	1,000081	1,000020	1.008092	1.000212	1.000072	1.080823	1,000019	1,000128	1.001041	1.001040	1.000080	1.000029	1.080028	1,000017	1.000004	1.000001	1.008026	1.000039	1.000000	1.080033	1.000100
6	30 20140	6 2.198256	1,180996	1.047495	1.020285	1.015281	1.006549	1.003275	1.001711	1,000000	1.001513	1.001075	1,000632	1.008689	1.000499	1.080621	1.000561	1.000147	1.000081	1.000030	1.000092	1.000212	1.000072	1.080823	1.000019	1.000128	1.001041	1.001040	1.000080	1.000029	1.010028	1.000017	1.000004	1.000001	1.008026	1.000039	1.000000	1.080033	1.000100
7	31 20140	2.300155	1.159840	1.049317	1.024413	1.015936	1.017536	1.005010	1.010142	1.001835	1.001513	1.001075	1.000632	1.008689	1.000499	1.080621	1.000561	1.000147	1.000081	1.000030	1.001092	1.000212	1.000072	1.010123	1.000019	1.000123	1.001041	1.001040	1.000080	1.080629	1.010028	1.000917	1.000304	1.000001	1.008028	1.000039	1.000000	1.080833	1.000100
*	32 20140	\$ 2.233100	1.116919	1.041617	1.015997	1.012315	1.006111	1.006298	1.082379	1.001835	1.001513	1.001075	1.000632	1.000629	1.000499	1.080621	1.000561	1.000147	1.000081	1.000030	1.001092	1.000212	1.000072	1.010823	1.000919	1.000128	1.001041	1.001040	1.000080	1.000029	1.010028	1.000017	1.000304	1.000001	1.008026	1.000039	1.000000	1.080833	1.000100
,	33 20140	9 2.253558	1.176389	1.061758	1.010012	1.068322	1.065557	1.005157	1.082379	1.001835	1.001513	1.001075	1.000632	1.002629	1.000499	1.010621	1.000561	1.000147	1.000081	1.000030	1.001092	1.060212	1.000072	1.010823	1.000319	1.000128	1.001041	1.001040	1.000080	1.080629	1.010028	1.000917	1.000304	1.000001	1.008026	1.000039	1.000000	1.010033	1.000100
50	34 20141	2.370562	1.149162	1.060162	1.026338	1.009222	1.003037	1.005157	1.082379	1.001005	1.001513	1.009975	1.000632	1.008689	1.000419	1.080621	1.000561	1.000147	1.000001	1.000020	1.001092	1.000212	1.080072	1.080823	1.000919	1.000120	1.001041	1.005040	1.000080	1.000029	1.080628	1.000917	1.000304	1.000001	1.008026	1.008039	1.000080	1.010033	1,020200
11	25 20141	2.240452	1.122023	1.037174	1.017254	1.011951	1.003037	1.005157	1.002379	1.001005	1.001512	1.001075	1.000622	1.008689	1000499	1.010621	1,000561	1.000147	1.000001	1.000020	1.001092	1.060212	1.000072	1.010023	1.000819	1.000120	1.001041	1.001040	1.000080	1.000029	1.080020	1.000917	1.000304	1.008001	1.008026	1.000039	1.000000	1.010033	1.020200
12	26 20141	2 2.135595	1.120506	1.041103	1.924224	1.011951	1.003037	1.005157	1.002379	1.001105	1.001512	1.001075	1.000622	1.008689	1.002499	1.080621	1,000561	1,000147	1.000081	1.000020	1.001092	1.000212	1.000072	1.010023	1.000919	1.000120	1.001041	1.001040	1.000080	1.000029	1.080028	1,000917	1.000304	1.008001	1.008026	1.000029	1.000000	1.080032	1.000800
1	27 20150	1 3.078491	1.245384	1.051612	1.024234	1.011961	1.003037	1,005157	1.082379	1.001835	1.001513	1,001075	1,000622	1.008689	1.000499	1,080621	1.000561	1,000147	1,000081	1,000020	1.008092	1.000212	1.000072	1.080823	1,000019	1,000128	1.001041	1.001040	1.000080	1.000029	1.080028	1,000017	1,000004	1.000001	1.008026	1.000039	1.000000	1.080033	1.000800
2	38 20150	2 2,984821	1.167617	1.051612	1.024234	1.011961	1.003037	1,005157	1.082379	1.001035	1.001513	1.001075	1,000622	1.008689	1.000499	1.080621	1.000561	1,000147	1.000081	1.000030	1.001092	1.000212	1.000072	1.010023	1.000019	1,000128	1.008041	1.001040	1.000080	1.000029	1.010028	1.000017	1.000004	1.000001	1.001026	1.000039	1.000000	1.080033	1.000100
3	29 Z0150	2.453425	1.16.76.17	1.051812	1.024234	1.011961	1.063657	1,405157	1.012379	1.001135	1.001913	1.001075	1.0008.52	1.0016.29	1000499	1,010121	1.000961	1.000147	1.000081	1.000030	1.001052	1.000212	1000072	1.010123	1,000019	1.000128	1.001041	1.001040	1000010	1000029	1.010028	1.000917	1,000004	1.001001	1.001025	1000039	1000010	1.010033	1.010100
3	39 20150	3 2.433425	1.167617	1.051612	1.024234	1.011951	1.063037	1.005157	1.012379	1.001835	1.001513	1.001075	1.000632	1.008689	1.000499	1.010621	1,000561	1.000147	1.000081	1.000030	1.001052	1.000212	1.000072	1.080823	1.000919	1.000128	1.001041	1.001040	1.000080	1.000029	1.010628	1,000917	1.000104	1.000001	1.001026	1.000039	1.000000	1.010033	1.020101

Refer to red portion of table 3 in Claims Data tab of

http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/2012/04/CAL-Heal th-Data-Solution-Final.xlsx

Table	2	<u>[</u>										
		Months of Development										
Month #	Incurred		1	2								
1	201201	\$	6,662,299	\$	20,509,826							
2	201202	\$	7,420,723	\$	22,149,528							
3	201203	\$	11,230,034	\$	26,751,818							
4	201204	\$	10,411,526	\$	25,553,020							
5	201205	\$	12,467,162	\$	27,052,723							
6	201206	\$	12,846,338	\$	28,239,541							
7	201207	\$	10,801,015	\$	24,851,572							
8	201208	\$	12,930,442	\$	28,874,976							
9	201209	\$	12,637,707	\$	28,479,802							
10	201210	\$	12,965,355	\$	30,735,181							
11	201211	\$	13,546,707	\$	30,353,458							
12	201212	\$	14,835,942	\$	31,683,558							
13	201301	\$	7,290,329	\$	22,443,210							
14	201302	\$	8,110,745	\$	24,209,120							
15	201303	\$	11,655,691	\$	27,765,804							
16	201304	\$	10,476,240	\$	25,711,848							
17	201305	\$	12,380,049	\$	26,863,694							
18	201306	\$	13,158,331	\$	28,925,381							
19	201307	\$	10,369,254	\$	23,858,153							
20	201308	\$	13,831,668	\$	30,887,504							
21	201309	\$	13,498,383	\$	30,419,385							
22	201310	\$	12,259,722	\$	29,062,434							
23	201311	\$	14,027,306	\$	31,430,313							
24	201312	\$	14,529,024	\$	31,028,106							
25	201401	\$	7,452,347	\$	22,941,980							
26	201402	\$	8,012,070	\$	23,914,593							
27	201403	\$	11,045,022	\$	26,311,089							
28	201404	\$	10,052,932	\$	24,672,923							
29	201405	\$	12,397,841	\$	26,902,302							
30	201406	\$	13,190,664	\$	28,996,458							
31	201407	\$	11,383,654	\$	26,192,140							
32	201408	\$	13,600,244	\$	30,370,711							
33	201409	\$	14,315,244	\$	32,260,228							
34	201410	\$	13,271,603	\$	31,461,161							
35	201411	\$	13,849,885	\$	31,032,775							
36	201412	\$	16,312,584	\$	34,837,067							
37	201501	\$	7,450,151	\$	22,935,220							
38	201502	\$	8,238,399	\$	24,590,144							
39	201503	Ś	11.922.196	Ś	29.011.767							

Estimating paid amounts for future months

Now we can project potential claims and fill in all the blank space from below the triangle in table on slide 23

I.e. Take 1st month of development from 3/2015 (\$11,922,196)

Multiply it by our development factor of from 1 to 2 for claims incurred 3/2015 (2.433425 found on slide 27)

This gives us a projected \$29,011,767 of needed money for 4/2015 to pay for claims that were incurred 3/2015

Filled in Table 2 (red)

Fill in the rest of Table 2 by dragging:

Table 2																																								
	Maa	the of D	evelopment																																					
anth \$ Incurre	4	1	2	3		5	6	7		,	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Ultimete
1 20120	1 \$ 6	662,299	\$ 20,509,826	\$ 25,542,602	\$ 27,424,1	7 \$ 28,871/	418 \$ 29,277,423	\$ 29,448,880	\$ 29,604,190	0 \$ 29,681,950	6 \$29,735,420	\$ 29,791,467	\$ 29,819,475	\$ 29,834,222	\$ 29,859,719	\$ 29,879,746	\$ 29,815,741	\$ 29,898,931	\$ 29,918,210	\$ 29,918,210	\$ 29,918,210	\$ 29,920,521	\$ 29,921,542	\$ 29,921,542	\$ 29,922,372	\$ 29,922,372	\$ 29,922,655	\$ 29,923,202	29,932,220 \$	29,932,220	\$ 29,933,939	\$ 29,933,939	\$ 29,933,939	\$ 29,933,940	\$ 29,933,940	\$ 29,934,128	\$ 29,934,244	\$ 29,934,244	\$ 29,936,246	\$29,936,246
2 20120	2 \$ 7	1,420,723	\$ 22,149,528	\$ 26,991,949	\$ 28,785,54	16 \$ 29,580;	\$ 29,969,223	\$ 30,113,931	\$ 30,315,299	9 \$ 30,355,43	9 \$ 30,411,072	\$ 30,456,394	\$ 30,492,890	\$ 30,493,622	\$ 30,511,130	\$ 30,514,477	\$ 30,525,454	\$ 30,621,847	\$ 30,631,872	\$ 30,640,063	\$ 30,640,063	\$ 30,640,063	\$ 30,640,063	\$ 30,640,388	\$ 30,644,889	\$ 30,645,315	\$ 30,645,315	\$ 30,645,773 \$	30,645,773 \$	30,645,773	\$ 30,645,773	\$ 30,645,773	\$ 30,645,911	\$ 30,645,911	\$ 30,646,075	\$ 30,646,075	\$ 30,650,753	\$ 30,650,753	\$ 30,650,753	\$ 30,650,753
2 20120	3 \$ 11	1,239,034	\$ 26,751,818	\$ 31,706,725	\$ 33,067,1	\$ 33,994,	121 \$ 24,111,460	\$ 24,370,549	\$ 24,579,520	\$ \$34,642,69	\$ \$ 34,715,506	\$ 34,849,061	\$ 34,901,926	\$ 24,919,257	\$ 24,919,257	\$ 24,946,422	\$ 35,069,731	\$ 35,072,484	\$ 35,074,178	\$ 35,070,700	\$ 35,078,788	\$ 35,000,417	\$ 35,090,626	\$ 25,090,002	\$ 25,099,002	\$ 25,090,002	\$ 35,135,292	\$ 35,135,202 \$	35,135,638 \$	35,135,638	\$ 35,135,638	\$ 35,135,628	\$ 25,125,628	\$ 25,125,628	\$ 25,125,620	\$ 35,125,638	\$ 35,135,638	\$ 35,135,663	\$ 35,136,030	\$ 35,136,030
4 20120	4 5 1	0,411,526	\$ 25,553,020	\$ 29,819,451	\$ 31,996,74	16 \$ 31,763,1	147 \$32,000,275	\$ 32,298,456	\$ 32,396,653	3 \$ 32,489,04	1 \$32,539,876	\$ 32,574,028	\$ 32,600,997	\$ 32,651,522	\$ 32,661,705	\$ 32,661,705	\$ 32,666,364	\$ 32,670,060	\$ 32,670,060	\$ 32,670,060	\$32,670,060	\$ 32,671,845	\$ 32,671,845	\$ 32,675,667	\$ 32,675,667	\$ 32,676,389	\$ 32,678,213	\$ 32,678,213 \$	32,678,213 \$	32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,678,213	\$ 32,612,318	\$ 32,682,318	\$ 32,682,326	\$ 32,683,419	\$ 32,683,419
5 20120	5 \$ 12	2,467,162	\$ 27,052,723	\$ 30,690,670	\$ 32,549,6	10 \$ 32,807,	\$33,409,708	\$ 33,593,893	\$ 33,888,216	6 \$ 33,939,161	9 \$ 34,001,608	\$ 34,024,461	\$ 34,054,317	\$ 34,088,034	\$ 34,203,545	\$ 34,259,896	\$ 34,284,327	\$ 34,299,176	\$ 34,299,176	\$ 34,304,004	\$ 34,304,740	\$ 34,304,740	\$ 34,339,567	\$ 34,339,567	\$ 34,339,567	\$ 34,340,456	\$ 34,340,456	\$ 34,340,456 \$	34,340,710 \$	34,340,710	\$ 34,340,710	\$ 34,340,712	\$ 34,341,145	\$ 34,342,222	\$ 34,342,222	\$ 34,342,222	\$ 34,343,566	\$ 34,343,574	\$ 34,344,722	\$ 34,344,722
6 20120	6 \$ 12	,046,330	\$ 20,239,541	\$ 23,250,786	\$ 34,934,8	\$ 35,643,1	603 \$ 36,100,173	\$ 36,425,174	\$ 36,544,453	\$ \$26,606,97	\$ \$ 36,606,978	\$ 34,455,500	\$ 26,712,921	\$ 36,753,753	\$ 36,770,908	\$ 36,794,149	\$ 34,002,002	\$ 34,057,422	\$ 36,857,896	\$ 36,857,896	\$ 36,860,518	\$ 36,862,733	\$ 36,000,954	\$ 26,000,954	\$ 26,000,954	\$ 24,010,954	\$ 26,084,003	\$ 34,005,351 \$	36,000,796 \$	36,000,796	\$ 36,009,014	\$ 36,009,601	\$ 36,894,065	\$ 36,094,065	\$ 26,094,065	\$ 26,095,020	\$ 36,096,402	\$ 26,896,491	\$ 36,897,725	\$ 36,897,725
7 20120	7 \$ 10	0,801,015	\$ 24,851,572	\$ 28,823,859	\$ 30,245,35	5 \$30,983,7	50 \$ 31,477,500	\$ 32,029,476	\$ 32,189,952	\$ \$2,194,52	7 \$32,366,549	\$ 32,436,340	\$ 32,461,982	\$ 32,486,145	\$ 32,509,444	\$ 32,504,519	\$ 32,543,261	\$ 32,547,432	\$ 32,551,357	\$ 32,551,357	\$ 32,554,079	\$ 32,558,799	\$ 32,566,038	\$ 32,583,447	\$ 32,583,447	\$ 32,513,447	\$ 32,513,510	\$ 32,589,223 \$	32,589,223 \$	32,589,339	\$ 32,589,339	\$ 32,596,798	\$ 32,596,798	\$ 32,596,798	\$ 32,596,827	\$ 32,597,687	\$ 32,598,963	\$ 32,598,970	\$ 32,600,060	\$ 32,600,060
\$ 20120	\$ \$ 12	930,442	\$ 28,874,976	\$ 32,251,022	\$ 33,593,2	\$ 34,130,6	24 \$34,553,332	\$ 34,764,480	\$ 34,983,420	0 \$ 35,125,955	5 \$ 35,179,828	\$ 35,205,925	\$ 35,225,279	\$ 35,249,542	\$ 35,265,328	\$ 35,266,673	\$ 35,266,673	\$ 35,269,093	\$ 35,279,690	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,281,844	\$ 35,282,520	\$ 35,283,739	\$ 35,283,980	\$ 35,283,980 \$	35,283,980 \$	35,283,980	\$ 35,287,767	\$ 35,287,767	\$ 35,287,767	\$ 35,287,925	\$ 35,287,957	\$ 35,288,888	\$ 35,290,268	\$ 35,290,277	\$ 35,291,457	\$ 35,291,457
9 20120	9 \$ 12	637,707	\$ 20,479,002	\$ 33,903,329	\$ 35,572,43	7 \$ 36,213,	153 \$ 36,514,514	\$ 36,717,433	\$ 36,840,900	6 \$ 37,030,44	\$ 37,005,192	\$ 37,097,034	\$ 37,115,140	\$ 37,115,149	\$ 37,148,270	\$ 37,164,259	\$ 37,167,336	\$ 37,967,336	\$ 37,171,406	\$ 37,171,406	\$ 37,176,869	\$ 37,178,393	\$ 37,178,393	\$ 37,178,393	\$ 37,178,393	\$ 37,178,580	\$ 37,178,580	\$ 37,589,377 \$	37,989,377 \$	37,189,377	\$ 37,109,377	\$ 37,109,661	\$ 37,190,293	\$ 37,190,460	\$ 37,199,493	\$ 37,191,474 \$	\$ 37,192,929	\$ 37,992,930	\$ 37,194,102	\$ 37,194,102
10 20121	\$ 12	1,965,255	\$ 30,735,181	\$ 35,319,716	\$ 37,444,63	\$ \$38,430,1	40 \$ 38,785,258	\$ 38,976,864	\$ 39,108,816	6 \$ 39,140,170	6 \$ 39,187,453	\$ 39,248,107	\$ 39,280,539	\$ 29,310,785	\$ 29,319,503	\$ 29,220,559	\$ 29,230,559	\$ 39,236,264	\$ 39,337,257	\$ 39,355,121	\$ 39,355,316	\$ 39,374,662	\$ 39,381,183	\$ 29,398,167	\$ 29,398,167	\$ 29,298,167	\$ 39,411,351	\$ 39,411,351 \$	39,413,964 \$	39,413,964	\$ 39,418,472	\$ 39,419,587	\$ 39,420,257	\$ 29,429,424	\$ 29,420,469	\$ 29,421,589	\$ 29,423,052	\$ 39,423,861	\$ 39,424,379	\$ 39,424,379
11 20121	1 \$ 13	,546,707	\$ 30,353,458	\$ 34,081,574	\$ 35,348,5	\$1 \$35,958,4	134 \$36,478,488	\$ 37,097,052	\$ 37,340,239	9 \$ 37,441,52	5 \$ 37,487,222	\$ 37,532,558	\$ 37,555,528	\$ 37,583,092	\$ 37,585,879	\$ 37,619,772	\$ 37,632,966	\$ 37,641,259	\$ 37,643,390	\$ 37,643,390	\$ 37,643,390	\$ 37,643,390	\$ 37,651,285	\$ 37,651,285	\$ 37,651,285	\$ 37,651,215	\$ 37,651,285	\$ 37,651,285 \$	37,651,285 \$	37,651,285	\$ 37,652,358	\$ 37,853,424	\$ 37,654,063	\$ 37,654,232	\$ 37,654,266	\$ 37,655,259	\$ 37,656,733	\$ 37,656,742	\$ 37,658,001	\$ 37,658,001
12 20121	2 \$ 14	1,835,942	\$ 31,683,558	\$ 35,760,803	\$ 37,481,0	4 \$ 38,221,0	30 \$ 38,543,218	\$ 38,861,131	\$ 38,960,974	9 \$ 39,192,881	0 \$ 39,349,261	\$ 39,397,126	\$ 39,499,293	\$ 39,508,185	\$ 39,539,136	\$ 39,550,571	\$ 39,576,375	\$ 39,590,842	\$ 39,590,842	\$ 39,592,998	\$ 39,597,096	\$ 39,597,096	\$ 39,597,096	\$ 39,597,096	\$ 39,597,096	\$ 39,604,194	\$ 39,604,994	\$ 39,604,359 \$	39,604,359 \$	39,604,372	\$ 39,605,501	\$ 39,606,621	\$ 39,607,294	\$ 39,607,472	\$ 39,607,507	\$ 39,600,552 \$	\$ 39,610,992	\$ 39,610,112	\$ 39,611,436	\$ 39,611,436
12 20130	1 \$ 7	1,299,329	\$ 22,443,210	\$ 27,950,407	\$ 20,089,27	3 \$ 31,592,	118 \$ 32,037,296	\$ 22,224,916	\$ 32,394,866	6 \$ 32,479,963	3 \$ 32,538,467	\$ 32,599,797	\$ 32,630,445	\$ 32,646,592	\$ 22,674,483	\$ 22,696,299	\$ 32,702,958	\$ 32,717,391	\$ 32,739,497	\$ 32,738,497	\$ 32,738,497	\$ 32,741,016	\$ 32,742,123	\$ 22,742,123	\$ 22,743,041	\$ 32,743,041	\$ 32,743,351	\$ 32,743,950 \$	32,745,248 \$	32,745,259	\$ 32,746,192	\$ 22,747,119	\$ 32,747,675	\$ 22,747,922	\$ 22,747,851	\$ 22,749,715	\$ 32,749,997	\$ 32,750,004	\$ 32,751,100	\$ 32,751,100
14 20130	2 \$ 1	\$,110,745	\$ 24,209,120	\$ 29,501,818	\$ 31,461,75	\$ \$ 32,330,1	\$ \$ 32,755,936	\$ 32,914,100	\$ 33,134,192	2 \$ 33,178,06	4 \$33,238,870	\$ 33,288,406	\$ 33,328,296	\$ 33,329,095	\$ 33,348,232	\$ 33,351,890	\$ 33,363,888	\$ 33,469,244	\$ 33,480,201	\$ 33,489,154	\$ 33,489,154	\$ 33,489,154	\$ 33,489,154	\$ 33,489,509	\$ 33,494,429	\$ 33,494,895	\$ 33,494,895	\$ 33,496,277 \$	33,497,605 \$	33,497,616	\$ 33,498,570	\$ 33,499,518	\$ 33,500,088	\$ 33,500,238	\$ 33,500,268	\$ 33,501,151	\$ 33,502,462	\$ 33,592,470	\$ 33,503,591	\$ 33,503,591
15 20130	3 \$ 11	1,655,691	\$ 27,765,884	\$ 32,908,519	\$ 34,320,46	9 \$ 35,189,	110 \$ 35,404,401	\$ 35,673,310	\$ 35,890,210	\$ 35,955,76	1 \$ 36,031,342	\$ 36,169,959	\$ 36,224,724	\$ 36,242,8%	\$ 36,242,816	\$ 36,271,021	\$ 36,398,993	\$ 36,401,850	\$ 36,403,608	\$ 36,408,393	\$ 36,408,393	\$ 36,418,387	\$ 36,420,680	\$ 36,420,863	\$ 36,420,863	\$ 36,420,863	\$ 36,425,539	\$ 36,427,042 \$	36,428,486 \$	36,428,498	\$ 36,429,536	\$ 36,430,567	\$ 36,431,186	\$ 36,431,350	\$ 36,431,382	\$ 36,432,343	\$ 36,433,769	\$ 36,433,777	\$ 36,434,996	\$ 36,434,996
16 20130	4 \$ 10	476,240	\$ 25,711,040	\$ 20,084,797	\$ 31,300,01	3 \$ 31,960,1	74 \$ 32,199,176	\$ 22,499,290	\$ 32,599,013	7 \$ 32,690,97	9 \$ 32,742,130	\$ 32,776,494	\$ 32,803,631	\$ 22,061,514	\$ 22,964,717	\$ 22,864,717	\$ 22,059,405	\$ 32,873,124	\$ 32,873,124	\$ 32,873,124	\$ 32,873,124	\$ 32,974,920	\$ 32,074,920	\$ 32,978,766	\$ 32,978,766	\$ 22,079,402	\$ 32,003,623	\$ 22,884,980 \$	32,886,284 \$	32,886,294	\$ 32,897,232	\$ 32,000,162	\$ 32,000,721	\$ 32,000,069	\$ 22,000,090	\$ 22,089,766	\$ 22,091,052	\$ 32,091,050	\$ 32,892,160	\$ 32,892,160
17 20130	5 \$ 12	380,049	\$ 26,863,694	\$ 30,476,221	\$ 31,924,99	7 \$ 32,578,	171 \$ 33,176,260	\$ 33,359,158	\$ 33,651,424	4 \$ 33,702,02	1 \$33,764,024	\$ 33,786,717	\$ 33,816,364	\$ 33,849,845	\$ 33,964,549	\$ 34,020,506	\$ 34,044,766	\$ 34,059,511	\$ 34,059,511	\$ 34,064,305	\$ 34,065,036	\$ 34,065,036	\$ 34,099,620	\$ 34,099,620	\$ 34,100,405	\$ 34,101,065	\$ 34,115,443	\$ 34,996,850 \$	34,998,202 \$	34,108,213	\$ 34,109,185	\$ 34,110,151	\$ 34,110,730	\$ 34,110,883	\$ 34,110,914	\$ 34,111,813 \$	\$ 34,113,148	\$ 34,113,156	\$ 34,114,297	\$ 34,114,297
18 20130	6 5 13	3,158,331	\$ 28,925,381	\$ 34,160,760	\$ 35,783,2	\$1 \$ 36,509;	\$37,067,058	\$ 37,309,815	\$ 37,431,991	1 \$ 37,496,035	5 \$37,496,035	\$ 37,545,826	\$ 37,605,586	\$ 37,646,375	\$ 37,663,947	\$ 37,687,752	\$ 37,696,615	\$ 37,752,562	\$ 37,753,048	\$ 37,753,048	\$ 37,755,734	\$ 37,758,003	\$ 37,776,667	\$ 37,779,403	\$ 37,788,273	\$ 37,781,083	\$ 37,745,854	\$ 37,787,413 \$	37,788,911 \$	37,788,923	\$ 37,790,000	\$ 37,791,070	\$ 37,791,712	\$ 37,791,881	\$ 37,791,915	\$ 37,792,912	\$ 37,794,391	\$ 37,794,400	\$ 37,795,664	\$ 37,795,664
19 20130	7 \$ 10	,369,254	\$ 23,050,153	\$ 27,671,651	\$ 29,036,33	4 \$ 29,745,3	102 \$ 30,219,215	\$ 30,749,126	\$ 30,903,900	\$ 30,907,57	9 \$ 31,072,725	\$ 31,139,726	\$ 31,164,343	\$ 31,107,540	\$ 31,201,267	\$ 31,205,179	\$ 31,242,372	\$ 31,246,376	\$ 31,250,144	\$ 31,250,144	\$ 31,252,757	\$ 31,257,200	\$ 31,263,905	\$ 31,266,170	\$ 31,266,090	\$ 31,267,494	\$ 31,271,509	\$ 31,272,799 \$	31,274,039 \$	31,274,049	\$ 31,274,940	\$ 31,275,025	\$ 31,276,357	\$ 21,276,497	\$ 31,276,525	\$ 31,277,350 \$	\$ 31,270,574	\$ 31,270,501	\$ 31,279,627	\$ 31,279,627
20 20130	* \$ 13	3,831,668	\$ 20,887,584	\$ 34,498,854	\$ 35,934,60	2 \$ 36,509,	461 \$ 36,961,631	\$ 37,187,495	\$ 37,421,696	6 \$ 37,574,16	5 \$ 37,631,793	\$ 37,659,709	\$ 37,680,412	\$ 37,706,366	\$ 37,723,252	\$ 37,724,691	\$ 37,724,691	\$ 37,727,280	\$ 37,738,616	\$ 37,740,920	\$ 37,740,920	\$ 37,744,407	\$ 37,752,398	\$ 37,755,122	\$ 37,756,081	\$ 37,756,731	\$ 37,761,579	\$ 37,763,137 \$	37,764,634 \$	37,764,646	\$ 37,765,723	\$ 37,766,791	\$ 37,767,433	\$ 37,767,603	\$ 37,767,636	\$ 37,768,633	\$ 37,770,110	\$ 37,770,119	\$ 37,771,382	\$ 37,771,382
21 20130	9 \$ 13	498,383	\$ 30,419,315	\$ 35,745,033	\$ 37,995,65	5 \$38,679,4	06 \$ 39,001,291	\$ 39,218,030	\$ 39,349,912	2 \$39,560,900	0 \$ 39,610,835	\$ 39,623,483	\$ 39,642,822	\$ 39,642,822	\$ 39,678,208	\$ 39,695,286	\$ 39,698,573	\$ 39,698,573	\$ 39,702,920	\$ 39,702,920	\$ 39,704,127	\$ 39,707,795	\$ 39,716,202	\$ 39,719,078	\$ 39,719,993	\$ 39,720,761	\$ 39,725,861	\$ 39,727,499 \$	39,729,074 \$	39,729,087	\$ 39,730,220	\$ 39,731,344	\$ 39,732,019	\$ 39,732,197	\$ 39,732,233	\$ 39,733,281	\$ 39,734,836	\$ 39,734,845	\$ 39,736,174	\$ 39,736,174
22 20131	5 12	259,722	\$ 29,062,434	\$ 33,397,450	\$ 35,496,72	7 \$ 36,339,3	\$ 36,674,389	\$ 36,855,567	\$ 36,910,338	8 \$ 37,009,99	\$ 37,054,695	\$ 37,112,048	\$ 37,142,715	\$ 37,171,315	\$ 37,179,559	\$ 37,110,013	\$ 37,190,013	\$ 37,995,502	\$ 37,996,346	\$ 37,999,375	\$ 37,200,505	\$ 37,203,942	\$ 37,211,819	\$ 37,294,594	\$ 37,215,371	\$ 37,2%,010	\$ 37,220,869	\$ 37,222,404 \$	37,223,880	37,223,892	\$ 37,224,953	\$ 37,226,006	\$ 37,226,639	\$ 37,226,806	\$ 37,226,839	\$ 37,227,821	\$ 37,229,278	\$ 37,229,287	\$ 37,230,532	\$ 37,230,532
23 2013	1 \$ 14	1,027,306	\$ 31,430,313	\$ 35,290,692	\$ 36,692,59	7 \$ 37,234;	138 \$ 37,772,642	\$ 28,413,151	\$ 39,664,966	6 \$ 38,769,84	5 \$ 38,817,162	\$ 38,864,107	\$ 38,887,892	\$ 28,916,424	\$ 20,919,320	\$ 28,954,415	\$ 28,968,077	\$ 39,976,664	\$ 38,982,386	\$ 38,985,560	\$ 38,986,745	\$ 38,990,347	\$ 38,998,602	\$ 29,001,426	\$ 29,002,324	\$ 29,003,079	\$ 29,083,036	\$ 29,089,695 \$	39,011,242 \$	39,011,255	\$ 39,012,367	\$ 29,012,471	\$ 29,014,124	\$ 29,014,209	\$ 29,014,243	\$ 29,015,272	\$ 29,016,899	\$ 39,016,908	\$ 39,018,212	\$ 39,018,212
24 20131	2 \$ 14	529,024	\$ 31,023,105	\$ 35,021,003	\$ 25,705,64	1 \$ 37,430,3	134 \$ 37,145,151	\$ 38,057,193	\$ 38,194,975	\$ \$38,582,07	9 \$ 38,935,225	\$ 38,582,100	\$ 38,882,193	\$ 38,698,861	\$ 55,721,172	\$ 58,752,310	\$ 55,797,640	\$ 33,119,591	\$ 33,785,090	\$ 38,788,248	\$ 38,189,421	\$ 38,793,011	\$ 38,801,224	\$ 38,804,034	\$ 38,804,927	\$ 55,809,817	\$ 33,810,640	\$ 38,812,281 \$	38,813,800 \$	38,813,812	\$ 38,814,919	\$ 38,816,017	\$ 38,816,817	\$ 38,816,891	\$ 20,216,215	\$ 35,817,919	\$ 38,819,428	\$ 33,819,437	\$ 33,820,735	\$ 38,820,735
25 20140	1 5 7	,452,347	\$ 22,941,910	\$ 28,571,567	\$ 30,676,2	\$ 32,295,	130 \$ 32,749,281	\$ 32,941,070	\$ 33,114,791	7 \$ 33,201,785	5 \$ 33,261,589	\$ 33,324,282	\$ 33,355,611	\$ 33,372,107	\$ 33,409,628	\$ 33,423,030	\$ 33,443,891	\$ 33,462,574	\$ 33,467,487	\$ 33,470,212	\$ 33,471,229	\$ 33,474,322	\$ 33,481,409	\$ 33,483,833	\$ 33,484,684	\$ 33,485,252	\$ 33,489,551	\$ 33,490,933 \$	33,492,261 \$	33,492,271	\$ 33,493,226	\$ 33,494,174	\$ 33,494,743	\$ 33,494,893	\$ 33,494,923	\$ 33,499,897 \$	\$ 33,497,117	\$ 33,497,525	\$ 33,498,245	\$ 33,498,245
26 20140	2 5 8	1,012,070	\$ 23,954,593	\$ 29,142,900	\$ 31,078,91	4 \$ 31,937,1	35 \$ 32,357,428	\$ 22,512,668	\$ 32,731,002	\$ \$32,774,42	2 \$ 32,034,400	\$ 32,893,422	\$ 32,922,926	\$ 22,923,6%	\$ 22,942,519	\$ 22,950,963	\$ 32,979,445	\$ 22,997,950	\$ 33,092,892	\$ 33,005,490	\$ 33,006,493	\$ 32,009,542	\$ 22,016,521	\$ 23,010,922	\$ 23,019,682	\$ 23,020,221	\$ 23,024,960	\$ 33,025,923	33,027,232 \$	32,027,242	\$ 32,020,104	\$ 22,029,119	\$ 33,029,600	\$ 22,029,928	\$ 23,029,858	\$ 23,030,729	\$ 33,032,022	\$ 33,032,029	\$ 33,032,134	\$ 32,032,134
21 20140	3 5 11	1,045,022	\$ 25,511,019	\$ 31,114,565	\$ 52,522,54	0 \$ 33,345,	4/1 \$33,549,485	\$ 33,804,304	\$ 34,009,840	0 \$ 34,071,95	1 \$ 34,143,578	\$ 34,214,935	\$ 39,326,829	\$ 54,345,975	\$ 54,361,653	\$ 54,584,788	\$ 54,416,157	\$ 34,425,471	\$ 34,430,929	\$ 54,455,528	\$ 34,434,515	\$ 34,431,555	\$ 34,444,847	\$ 59,441,542	\$ 54,445,155	\$ 54,443,891	\$ 54,495,224	\$ 54,494,845 \$	34,456,011 \$	34,456,022	\$ 34,457,004	\$ 34,451,919	\$ 34,498,969	\$ 34,451,720	\$ 34,455,750	\$ 54,454,654	\$ 34,461,008	\$ 34,461,016	\$ 34,462,168	\$ 34,462,168
28 20140	4 5 10	092,932	\$ 24,612,923	\$ 28,792,410	\$ 30,035,38	\$ \$ 30,669.	161 \$ 30,898,122	\$ 31,184,033	\$ 31,280,848	\$ \$ 31,370,05	4 \$ 31,419,138	\$ 31,452,114	\$ 31,478,194	\$ 31,498,049	\$ 31,519,740	\$ 31,535,473	\$ 31,555,071	\$ 31,572,784	\$ 31,977,419	\$ 31,579,991	\$ 31,930,950	\$ 31,583,868	\$ 31,590,555	\$ 31,592,843	\$ 31,593,510	\$ 31,594,101	\$ 31,598,238	\$ 31,599,541 \$	31,600,794 \$	31,400,304	\$ 31,601,705	\$ 31,602,599	\$ 31,603,136	\$ 31,603,278	\$ 31,603,306	\$ 31,684,140	\$ 31,615,376	\$ 31,605,384	\$ 31,606,441	\$ 31,606,441
29 20140	9 5 14	2,397,041	\$ 24,902,302	\$ 10,920,021	\$ 31,970,00	\$ 32,424,1	92 \$ 33,223,940	\$ 33,407,101	\$ 33,099,701	1 \$ 33,790,49	7 \$ 33,012,949	\$ 33,039,279	\$ 33,971,647	\$ 11,041,045	\$ 23,994,399	\$ 33,933,329	\$ 33,994,413	\$ 33,913,413	\$ 33,979,461	\$ 33,991,667	\$ 33,402,200	\$ 33,905,400	\$ 33,992,999	\$ 33,999,097	\$ 13,999,039	\$ 33,996,497	\$ 24,010,012	\$ 24,092,254 \$	34,003,616	34,003,923	\$ 14,004,591	\$ 14,005,995	\$ 34,006,133	\$ 34,006,209	\$ 24,005,235	\$ 24,007,213	\$ 24,000,943	\$ 24,000,991	\$ 34,009,609	\$ 34,009,609
30 20140	5 13	6,199,664	\$ 28,995,458	\$ 54,244,792	\$ 35,871,9	0 \$ 36,598,1	172 \$ 37,158,141	\$ 37,401,494	\$ 37,923,970	0 \$ 37,588,17	1 \$ 37,588,171	\$ 37,845,032	\$ 37,885,500	\$ 37,709,307	\$ 51,159,289	\$ 31,194,122	\$ 31,111,504	\$ 37,798,791	\$ 37,804,540	\$ 37,807,418	\$ 37,008,567	\$ 37,812,061	\$ 37,820,064	\$ 31,822,805	\$ 31,823,616	\$ 31,824,401	\$ 51,829,284	\$ 37,830,824 \$	51,852,524	31,832,536	\$ 37,835,419	\$ 37,834,489	\$ 31,855,125	\$ 31,859,246	\$ 51,859,554	\$ 57,858,550	\$ 37,837,810	\$ 31,831,819	\$ 37,839,884	\$ 37,839,884
31 20140		1,303,634	\$ 26,192,100	\$ 30,310,100	\$ 31,010,00	0 \$ 52,655,	106 \$ 33,115,490	\$ 33,191,241	\$ 33,926,315	\$ 33,731,19	6 \$ 33,999,141	\$ 34,046,361	\$ 24,000,100	\$ 24,104,670	\$ 34,120,193	\$ 24,142,227	\$ 34,860,840	\$ 34,000,020	\$ 34,090,641	\$ 34,195,451	\$ 34,194,410	\$ 34,191,627	\$ 34 204 365	\$ 34,201,345	\$ 24,200,124	\$ 24,200,199	\$ 34,615,990	\$ 34,614,997 \$	34,210,996 \$	34,210,961	\$ 34,216,942	\$ 38,211,910	\$ 34,210,492	\$ 34,210,049	\$ 34,230,010	3 34,217,510	\$ 34,620,917	\$ 34,220,925	\$ 34,222,010	\$ 34,222,010
32 20140		0.000,244	\$ 30,370,711	\$ 33,921,637	\$ 35,333,34	2 3 35,690,0	103 \$ 36,343,207	\$ 36,565,293	\$ 36,195,574	\$ 36,003,12	<pre>x x x x x x x x x x x x x x x x x x x</pre>	\$ 37,000,535	\$ 37,040,310	\$ 57,011,725	\$ 37,097,263	\$ 37,115,710	\$ 27,120,046	\$ 37,199,694	\$ 37,065,049	\$ 37,160,175	\$ 37,169,305	1 17,172,739	\$ 37,100,609	\$ 37,103,302	\$ 27,104,190	\$ 37,104,077	\$ 37,109,601	\$ 37,991,999 \$	37,992,060	10.000.070	\$ 37,193,732	\$ 37,194,704	\$ 37,199,416	\$ 37,199,983	\$ 37,119,616	17,116,010	1 17,110,053	\$ 37,790,002	\$ 37,999,306	\$ 37,999,306
20 20140	2 2 2	4,315,244	\$ 24,619,660	\$ 31,720,201	\$ 40,274,24	4 \$ 41,420,	07 \$ 41,361,415	\$ 41,071,324	5 41,000,01	1 \$ 41,700,Lot	6 \$ 41,704,670	5 46,041,107	\$ 46,076,710	5 46,117,044	\$ 40,700,017	5 46,157,510	\$ 46,177,024	\$ 46,617,711	\$ 46,669,107	\$ 46,667,141	\$ 46,630,431	5 46,65 4,50E	\$ 46,645,614	\$ 46,645,333	\$ 46,641,000	\$ 46,640,165	\$ 46,675,741	\$ 46,655,650 \$	40,030,700 \$	46,696,717	\$ 46,690,104	\$ 46,697,300	\$ 40,000,000	\$ 46,607,601	\$ 46,600,000	\$ 46,007,000 B	ac, 000,000	\$ 46,695,094	\$ 46,654,711	\$ 46,654,911
34 20141		5,211,605	\$ 31,461,061	\$ 36,123,762	3 34 327 07	N \$ 37,336,5	56 \$ 39,101,306	\$ 40,022,405	\$ 40,220,001	1 \$ 40,524,50	0 \$40,400,515	\$ 40,461,607	\$ 40,505,165	\$ 40,550,115	\$ 40,000,000	\$ 40,010,741	\$ 40,004,027	\$ 40,020,992	\$ 40,652,916	\$ 40,636,225	\$ 40,651,460	\$ 40,641,215	\$ 40,047,017	\$ 40,002,100	\$ 40,000,000	\$ 40,034,403	\$ 40,037,103	\$ 40,001,002 \$	40,002,774 \$	40,665,001	\$ 40,004,100	\$ 40,000,011	\$ 40,866,005	\$ 40,000,170	\$ 40,000,221	3 40,001,077 3	\$ 40,000,071	\$ 40,000,000	\$ 40,610,260	\$ 40,610,260
35 2014		0.047,010	\$ 31,032,115	\$ 34,044,327	\$ 36,139,63	5 36,763,	102 \$ 31,202,931	\$ 37,503,004	\$ 37,097,201	5 51,100,00	1 \$ 31,050,110	\$ 37,919,300	\$ 37,996,166	\$ 31,900,124	\$ 50,000,240	\$ 30,025,261	\$ 20,040,092	\$ 30,070,251	\$ 30,075,040	\$ 30,070,940	\$ 30,000,097	\$ 30,003,010	\$ 30,001,670	\$ 30,094,437	\$ 20,099,394	\$ 20,010,051	\$ 30,900,942	\$ 30,002,014 \$	30,004,024 \$	10,004,037	\$ 30,109,123	\$ 36,106,201	\$ 30,100,049	\$ 30,107,020	\$ 20,107,034	100,100,009	10,109,550	\$ 10,000,000	\$ 30,110,033	\$ 30,110,033
20141		7,0 M,934	\$ 27,037,087	\$ 27,820,525	• •1,611,99	· · · · · · · · · · · · · · · · · · ·	···· · ·······························	a 24,000 611	* ********		7 8 46 46 7 421	* ************************************	*******	\$ 42,507,505	* 34 000 D.D.	· ······	1 24 044 494	* ***,/10,985	+ 34 MO 345	\$ 45,720,962	* ********	* ************************************	\$ 10,135,528	* 40,175,799	* ************************************	* 24 000,000	a 24 004 200	* 74 cm/ cm/		24 002 242	· ····································	\$ 10,192,262	* 10,192,005	* ************************************	a hay 1 m3, 041	34,124,299	* ************************************	* 10,106,118	************************************	1 10,101,001
31 20150		1,409,101	\$ 24,755,220	\$ 20,593,948	\$ 39,037,33	· \$ 30,785,4	51 \$ 51,133,253	\$ 34,389,038	\$ 51,546,333	o \$ 51,821,957	a \$ 51,881,949	\$ 31,729,411	\$ 31,763,580	\$ 51,185,848	\$ 51,009,942	\$ \$1,821,419	\$ 51,841,194	\$ 31,699,068	\$ 51,683,745	\$ 31,686,340	\$ 51,687,308	\$ 51,670,255	\$ 31,877,000	3 34,019,309	\$ 51,689,043	\$ 31,020,659	\$ 51,014,192	\$ 21,000,000 \$	51,001,552 \$	51,001,542	\$ 31,068,251	\$ 31,089,193	3 31,069,895	3 31,007,855	3 35,009,867	3 31,079,193	\$ 21,071,995	\$ 51,071,983	\$ 51,073,030	\$ 51,043,030
20 20150		1 022 166	24 510 104	0 22 074 625	15 622 60	0 0 76 496 3	20 0 26 022 666	\$ 31,340,455	\$ 37,412,246	0 0 37 502 24	2 0 37 572 946	\$ 31,078,002	\$ 37 670 205	27 694 004	\$ 37 749 972	\$ 27 739 980	\$ 37 762 252	\$ 32,024,954	\$ 32,029,600	\$ 32,032,263	\$ 37,793,237	\$ 32,036,197	\$ 27 904 717	\$ 32,045,300	\$ 32,000,037	\$ 32,046,657	\$ 32,030,772	\$ 37,052,054 \$	37 846 870	37,016,003	\$ 37,054,205	\$ 32,005,106	\$ 37,055,740	\$ 37,055,004	\$ 32,035,913	37 020 074	37 022 454	\$ 37,022,462	\$ 32,009,092	\$ 32,009,092
		n rang 179	 A 10 (10) 		100,000,000			***,667,616	 Context 		 • • • • • • • • • • • • • • • • • • •		101010000		* **************		1	* 01,100,001		************	************	 PAL (75) (10) 		* ************************************	* P 110 P 10 8 9		· ····	A STORAGE A	#1(#19/719 B	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		 experiment 	* PAGe 17,112	 P 1 (P 1) (P 1) (P 1) 	* ************************************		a strange and	A DOLLAR DE	* * 11 TH 01 TH T	IDND C

Refer to red portion of table 2 in Claims Data tab of <u>http://actuaryclub.pstat.ucsb.edu/wp-content/uploads/2012/04/CAL-He</u><u>alth-Data-Solution-Final.xlsx</u>

* • • *

Estimating the IBNR

Since we have an estimate of how much the claims incurred at every given month will ultimately cost, we can subtract it from the total amount of claims already paid out for that month.

Sum them up to get an estimate of the IBNR

Last column of Table 2

Incurred	But Not Paid
Ś	_
Ś	-
Ś	1.175
S	1,101
Ś	2,500
Ś	3.660
S	3,262
S	3,690
S	4,521
S	5,907
\$	6,716
\$	7,077
\$	7,150
\$	8,696
\$	14,133
\$	13,394
\$	14,677
\$	18,997
\$	22,339
\$	30,462
\$	33,254
\$	34,186
\$	41,549
\$	63,095
\$	75,215
\$	90,615
\$	118,195
\$	128,287
\$	174,414
\$	250,913
\$	290,874
\$	403,732
\$	673,189
\$	968,874
\$	1,347,641
\$	2,546,029
\$	3,329,882
\$	7,468,948
\$	25,901,532
\$	44,109,882
\$	1,395,226,868

Questions?

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CAL Case Competition

Meet with teammates, exchange contact info, create a schedule

Register by tomorrow March 4, 11:59 PM

Fill out form: http://bit.ly/2lcddUU once per team with (name,school, year, major, email for all members)