70.2 - CMS-HCC Risk Adjustment Model
(Rev. 114, Issued; 06-07-13, Effective: 06- 07-13, Implementation: 06-07-13)

The CMS-HCC risk adjustment model is used to calculate risk scores for aged/disabled beneficiaries and is used in bidding and payment for Part A and B benefits, under the Part C program. In this section, CMS will discuss in detail the specific characteristics of the CMS-HCC risk adjustment model.

70.2.1 - Community, Institutional, and New Enrollee Segments
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MA uses separate models for aged/disabled (non-ESRD) community and long-term institutional residents. CMS created the separate models because there are significant cost differences between the community-based Medicare beneficiaries and the long-term institutionalized beneficiaries with the same disease profile. Adjusting payment for place of residence improves payment accuracy.

Long-term institutionalized MA enrollees are individuals residing in an institution for more than 90 days as identified using 90-day assessments in the Minimum Data Set

(MDS). Short term institutionalized MA beneficiaries are included in the community population.

During the payment year, CMS assigns a new enrollee factor to any beneficiary who does not have 12 months of diagnoses to support a risk score. Operationally, CMS identifies new enrollees as those beneficiaries with less than 12 months of Medicare Part B entitlement during the data collection year.

Part A only enrollees are defined as beneficiaries with 12 months of entitlement to benefits under Part A and less than 12 months of Part B enrollment during the data collection period and are treated as new enrollees, unless the enrolling organization elects to have them treated as a full risk enrollee.

Starting in payment year 2006, organizations may elect to have CMS determine payments for all "Part A-only" enrollees using either new enrollee factors or full risk adjustment factors. The organization's decision is applied to **all** "Part A-only" enrollees in the plan. Plans may not elect to move some eligible "Part A-only" enrollees into risk adjustment, while retaining others as new enrollees.

- If an organization elects the option, it remains turned "on" until CMS is notified otherwise. Notification must occur prior to August 31st of any successive year.

- CMS will apply the option only during final reconciliation for a payment year, and not prospectively.

- Plans interested in the option must contact CMS at Andrew.Keenan@cms.hhs.gov by August 31st prior to each payment year to elect the option.

Table 4 provides information on which risk adjustment factor applies to payment.

Table 4. Which Risk Adjustment Factor Applies to Payment*

Time Period Beneficiary Has Been Enrolled in Part B Medicare**	**Time Period Beneficiary Has Been Entitled to Benefits Under Part A Medicare****	
	0 - 11 months	≥ 12 months
0 – 11 months	new enrollee factors	Plan's option: new enrollee or full risk adjustment factors
≥ 12 months	full risk adjustment factors	full risk adjustment factors

*Applies to Part C and D payments for MA plans, demonstrations, and PACE organizations. Note that Medicare beneficiaries must be entitled to benefits under Part A and enrolled in Part B to enroll in an MA plan.

**During data collection period. The data collection year is a lagged year for initial risk scores and is the previous calendar year for mid-year and final risk scores.

70.2.2 - Risk Score for Long Term Institutionalized Beneficiaries
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The Part C risk adjustment model applies a beneficiary's institutional risk score to payment in those payment months when the enrollee has long term institutional (LTI) status. Unlike most factors in CMS-HCC risk adjustment models, which are recognized in the year prior to the payment year, institutional status is recognized in the payment year itself; this concurrent approach more accurately reflects treatment patterns upon which costs are based.

To determine a beneficiary's LTI status for payment purposes, CMS uses the reporting of a 90-day assessment. This information is collected routinely from nursing homes, which report to the States and CMS on at least a quarterly basis. This data is stored in the Minimum Data Set (MDS). Payment at the long-term rate starts in the month following the assessment date. Once persons are identified, they remain in long-term status until discharged to the community for more than fourteen days. The costs of the short term institutionalized (less than 90 days) are recognized in the community model.

Note that the institutional marker used for demographic payments is used differently from the institutionalized marker that is used in the CMS-HCC risk adjustment model. The institutional marker that was used in demographic payments increased payments over a demographic base and had the effect of capturing the higher costs of older and sicker people who go into skilled or unskilled levels of care. In the risk adjustment model, the health status markers capture most of these characteristics.

Because CMS calculates initial and mid-year risk scores before it has complete data on beneficiaries' LTI status in the payment year, CMS uses the presence of a 90-day assessment reported for any one month during the 12-month data collection period as a proxy for LTI in the payment year. At the final payment reconciliation that takes place post-contract year, CMS uses each beneficiary's actual month-by-month LTI status in the payment year to determine which risk score or multiplier to apply.

CMS turns on the LTI flag and applies an institutional risk score for initial payments starting January of the payment year when a beneficiary has had a 90-day assessment reported for any one month during July - June prior to the payment year (e.g., July 2008 through June 2009 for 2010 – this is the data collection period for initial payments). CMS would apply this same score until it calculates the mid-year risk scores, at which time CMS will update the LTI flag and institutional risk score if the person had a 90-day assessment reported for any one month during data collection year (e.g., 2009 for 2010 payment year) for mid-year updates. (Mid-year scores take effect in July, and remain in effect through the end of the contract year.)

Membership Monthly Report (MMR) fields specific to LTI status.

1. Part C LTI FLAG (field 20; position 67) - This flag means that the beneficiary has been institutionalized for at least 90 days as of the payment month. CMS will turn on LTI for risk adjustment when a beneficiary has a reported 90-day assessment. It continues to be populated until the beneficiary has a more than 14-day absence from the facility.

2. RA Factor Type Code (field 47; positions 189-90) – A value of "I" means that the enrollee has been institutionalized 90+ days as of the payment month.

70.2.3 - Demographic Factors in the CMS-HCC Model
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The CMS-HCC model is a combination of demographic and disease-based factors.

The demographic variables include:

- **Age** as of February 1st of the payment year.

- **Sex** of the beneficiary.

- **Disabled Status** results in the inclusion of additional factors in the risk scores of community residents who are disabled beneficiaries under 65 years old.

- **Original Reason for Entitlement** results in the inclusion of a factor in the risk score for beneficiaries 65 years of age or older who were originally entitled to Medicare due to disability; the factor differs by the age and sex of the beneficiary.

- **Medicaid Eligibility** results in the inclusion of an additional factor in the risk score.

70.2.4 - Original Reason for Entitlement Code (OREC)
(Rev. 114, Issued; 06-07-13, Effective: 06- 07-13, Implementation: 06-07-13)

In CMS' calculation of the MA payment, CMS includes an additional factor in the risk score based on the original reason the beneficiary became eligible for Medicare. Table 5 outlines the application of the factor based on original reason for entitlement. The Monthly Membership Report reflects the OREC identified in MARx.

Table 5. Original Reason for Entitlement Codes and Descriptions

OREC	Description	Factor Application
0	Beneficiary insured due to age	CMS applies no additional factor.
1	Beneficiary insured due to disability	CMS applies the same factor for OREC 1 and 3.

2	Beneficiary insured due to ESRD	CMS applies no additional factor under the CMS-HCC model.
3	Beneficiary insured due to disability and current ESRD	CMS applies the same factor for OREC 1 and 3.

Example (example uses the CMS-HCC risk adjustment model used in payment for years 2009 through 2011):

- An 83 year old man who originally became entitled to Medicare as disabled is diagnosed with pneumococcal pneumonia (ICD-9 code 481, HCC112).
- Originally insured due to disability, OREC = 1
- Originally disabled, male = 0.168
  Pneumococcal Pneumonia, Emphysema, Lung Abscess, HCC112 = 0.249
- Risk Score = (demographics) + 0.168+0.249

Example (example uses the CMS-HCC ESRD dialysis risk adjustment model used in payment for years 2008 through 2011):

- A 72 year old man who became had originally been entitled to Medicare as disabled is diagnosed with End-Stage Renal Disease (ESRD) with renal dialysis status (ICD-9 code V451, HCC130).
- Originally insured due to disability with current ESRD, OREC = 3
- Male, originally entitled due to disability (non-ESRD) = 0.032
  Renal Dialysis Status, V451, HCC130 = 0.0000
- Risk Score = (demographics) + 0.032+0.000

70.2.5 - Medicaid

(Rev. 114, Issued; 06-07-13, Effective: 06- 07-13, Implementation: 06-07-13)

The CMS-HCC and ESRD risk adjustment models include a Medicaid factor. If a beneficiary has Medicaid status in the appropriate time period, the relative factor associated with Medicaid is included in the calculation of the beneficiary risk score. Medicaid is defined as being eligible for Title XIX under an approved Medicaid State Plan, including eligibility for full Medicaid benefits as well as those who are eligible only under one of the Medicare Savings Program categories, e.g., Qualified Medicare Beneficiary (QMB), Specified Low-Income Medicare Beneficiary (SLMB).

Full risk beneficiaries:

The Medicaid factor is included in the risk score when CMS has data indicating that the beneficiary is Medicaid eligible for one month or more in the data collection year. For example, when calculating final 2009 risk scores, the beneficiary will have Medicaid included in their risk score if they were eligible for Medicaid at least one month in 2008. (Note: When calculating initial and mid-year risk scores, CMS may look to early time periods to determine whether or not to assign Medicaid status in the risk score.)

New enrollees:

For individuals with less than 12 months of Part B enrollment in the data collection period the Medicaid factor is included in the calculation of the risk score when the beneficiary is Medicaid for one or more months in the payment year. For example, when calculating final 2009 risk scores, the beneficiary will have Medicaid included in their risk score if they were eligible for Medicaid at least one month in 2009.

In order to appropriately assign Medicaid status to beneficiaries, CMS obtains data on Medicaid eligibility from several sources. For payment year 2008 and later, the following data sources are used:

1. MMA Medicare/Medicaid Dual Eligible monthly file (MMA State files): These files provide monthly identification of each actively enrolled Medicare/Medicaid dual eligible beneficiary, including a person-month record for each Medicare/Medicaid dual eligible in a State Medicaid program in the reporting month. The MMA State files also report information on changes in the circumstances for individuals in a prior month. The files include those eligible for comprehensive Medicaid benefits (whether eligible through the state plan or a section 1115 demonstration), as well as those for whom the State pays Medicare premiums and/or cost sharing (Qualified Medicare Beneficiaries, Specified Low-Income Medicare Beneficiaries, and Qualifying Individuals). CMS also uses this data to identify low income beneficiaries under Part D.

2. Puerto Rico monthly submission file: CMS has arranged with Puerto Rico to submit files similar to the MMA State files for beneficiaries who are Medicaid eligible in Puerto Rico.

3. Point-of-Sale data: Submitted to assist pharmacies in identifying low income beneficiaries under Part D.

4. Plan-reported Medicaid status: Plans can report retroactive Medicaid status via the Retro Processing Contractor (RPC). The RPC requires documentation of Medicaid eligibility and confirmation that the beneficiary is not already in CMS data systems prior to updating the beneficiary record based on plan submissions. Please note that plan-reported Medicaid status must be posted to the CMS data systems in time for risk score calculation runs. For more information on plan-reported updates of Medicaid status, including timing and documentation needs, please refer to the Standard Operation Procedure (SOP) for the RPC.

CMS changed the sources used to identify beneficiaries as Medicaid with the 2008 payment year. Table 6 below shows the data sources used by payment year:

Table 6. Data sources for identifying the Medicaid eligibility of Medicare beneficiaries:

<table>
<tr><th></th><th>Payment year 2007 and earlier years</th><th>Payment year 2008</th><th>Payment year 2009 and later years</th></tr>
<tr><td>New enrollees</td><td rowspan="2">1. Third Party Buy-In file
2. Plan-reported Medicaid
• Batch “01” transactions
• Retroactive updates through the Retro Processing Contractor (RPC)</td><td>1. MMA State files
2. Plan-reported
• Retroactive updates through the RPC</td><td rowspan="2">1. MMA State files
2. Plan-reported
• Retroactive updates through the RPC</td></tr>
<tr><td>Full risk enrollees</td><td>1. MMA State files
2. Third Party Buy-In file
3. Plan-reported Medicaid
• Batch “01” transactions
• Retroactive updates through the RPC</td></tr>
</table>

Notes: CMS considers full risk Medicare beneficiaries as dually-eligible if they were eligible for Title XIX during any month in the year prior to the payment year. Full risk Medicare beneficiaries have 12 months of Part B enrollment in the year prior to the payment year. CMS assigns Medicaid status for new enrollees on a concurrent basis, i.e., if a newly-enrolled Medicare beneficiary is eligible for Title XIX during any month during the payment year, they are considered Medicaid for that year.

Checking Medicaid status used in payment:

While plans are permitted to submit Medicaid status for their enrollees who are not otherwise reported as Medicaid, plans first must conduct analyses of the available data from CMS to confirm that CMS does not already have Medicaid status reported for the beneficiary.

Table 7 below illustrates how to use the MMR to determine Medicaid status. For a description of fields 19, 21, 23, and 47, please see the latest version of the Monthly Membership Report.

Table 7. Using the MMR to identify Medicaid status

If the enrollee is a "full risk" enrollee, i.e., has 12 months of Part B in the data collection period	Field 47 (RA Factor Type code) = C, C1, C2, D, G1, G2, I, I1, or I2 and Field 23 (Default Risk Factor code) = blank
Medicaid is used in calculating the risk score if enrollee was Medicaid for at least one month in the data collection period	Field 19 = blank **Use Field 21 to determine Medicaid status –** Field 21 = Y Indicates that Medicaid status was used in calculating the risk score, i.e., at least a one month period of Medicaid eligibility during the data collection period was established in CMS systems at the time that risk scores were calculated. Field 21 = blank, Indicates that no Medicaid period of eligibility was established in CMS systems during the data collection period.
If the enrollee is a "new enrollee," i.e., does not have 12 months of Part B in the data collection period – And they were present in the Medicare Beneficiary Database at the time that the Risk Adjustment System (RAS) pulled data for calculating risk scores… A "new enrollee" risk score will be assigned in RAS.	Field 47 (RA Factor Type code) = E, ED, E1, or E2 and Field 23 (Default Risk Factor code) = blank
Medicaid is used in assigning the new enrollee risk score if the enrollee was Medicaid for at least one month in the payment year.	Field 19 = blank **Use Field 21 to determine Medicaid status –** Field 21 = Y Indicates that Medicaid status was used in assigning the new enrollee risk score, i.e., at least a one month period of Medicaid eligibility during the payment year was established in CMS systems at the time that the risk score was assigned. Field 21 = blank

	Indicates that no Medicaid period of eligibility was established in CMS systems during the payment year. Note: The application of Medicaid status based on Medicaid periods during the payment year will happen at final payment reconciliation (conducted in the year following the payment year). New enrollees who are assigned a RAS risk score during the initial risk score run are assigned Medicaid status if they are Medicaid for at least one month during the lagged data collection period (July-June prior to the payment year) or during any one month after June, but prior to the risk score run. New enrollees who are assigned a RAS risk score during the mid-year risk score run are assigned Medicaid status if they are Medicaid for at least one month during the year prior to the payment year or any one month during the payment year. At final payment reconciliation, Medicaid status will be applied to the final risk score if there is a Medicaid period of at least one month during the payment year.
If the enrollee does not have a RAS-generated risk score, either because – o the enrollee was <u>not</u> present in the Medicare Beneficiary Database at the time that RAS pulled data for calculating risk scores, i.e., they were neither entitled to Part A nor enrolled in Part B at the time of the risk score run, or o the enrollee has RAS factors for community and institutional, but has a newly-reported ESRD status (RAS did not know to generate a CMS-HCC ESRD risk score for the beneficiary) – The payment system will not have the appropriate risk score passed to it from RAS for these beneficiaries; the payment system will assign the appropriate default risk score in these cases (aged/disabled, ESRD).	Field 23 is populated with 1, 2, 3, 4, 5, 6, or blank depending on type of default score used (see the PCUG for more information about the MMR file layout). Prior to 2009: Field 47 (RA Factor Type code) = blank and Field 23 (Default Risk Factor code) = Y (indicates that a default risk score was assigned by the payment system) Note: Default risk scores may be needed throughout the payment year, since RAS may not be able to generate the appropriate risk scores during the initial and mid-year risk score runs. At final payment reconciliation (conducted in the year following the payment year), all beneficiaries enrolled during the payment year – both full risk and new enrollees - will receive RAS-generated risk scores, i.e., no default risk scores are assigned at final payment reconciliation.
Medicaid is used in assigning the default risk score if the enrollee was Medicaid for at least one month in the payment year.	Field 21 = blank **Use Field 19 to determine Medicaid status –** Field 19 = Y

	Indicates that Medicaid status was used in assigning the new enrollee risk score, i.e., at least a one month period of Medicaid eligibility during the payment year was established in CMS payment system at the time that the default risk score was assigned. Field 19 = N Indicates that no Medicaid period of eligibility was established in CMS systems during the payment year. Note: For default risk scores assigned to beneficiaries at the beginning of a payment year, the payment system assigns default risk scores using Medicaid if the beneficiary has Medicaid for at least one month in the year previous to the payment year (since payment-year Medicaid status is unknown). During the payment year, the payment system checks quarterly for updates to the Medicaid status of default beneficiaries and adjusts their Medicaid status according to the rules for default enrollees.

Notes: The data collection period is the 12 month period from which CMS uses diagnoses when calculating risk scores. For mid-year and final risk scores, the data collection period is the calendar year prior to the payment year (2007 for 2008 payment year). For initial risk scores (those used for prospective payments from January – June in a payment year), the data collection period is the July (two years prior) – June (in the year prior to payment year). For example, for 2010 initial risk scores, CMS used July 1, 2008 – June 30, 2009 for the data collection period.

70.2.6 - Disease Hierarchy

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Disease hierarchies address situations when multiple levels of severity for a disease, with varying levels of associated costs, have been reported for a beneficiary. The hierarchies prioritize the inclusion in a risk score of multiple HCCs where diagnoses are clinically related and ranked by costs. In the case of a disease hierarchy, Part C payment is based only on the most severe and costly manifestation of the disease. Hierarchies are published in the Rate Announcement for the years when CMS recalibrated the CMS-HCC model.

The following example demonstrates how the hierarchy logic is applied in the CMS-HCC risk adjustment model used for payment. :

An individual residing in the community with diabetes, which progresses over a year from having no complications (ICD-9 code 2500, HCC19) to having diabetes with ketoacidosis (ICD-9 code 2501). Diabetes with ketoacidosis is in the HCC for diabetes

with acute complications (HCC17). The progression of the disease would trigger the payments for HCC17, but not for HCC19. HCC17 is the more severe manifestation of the disease and the payments for HCC17 are higher than for HCC19.

CMS-HCC DISEASE HIERARCHIES

If the Disease Group is Listed in This Column…		**…Then Drop the Associated Disease Group(s) Listed in This Column**	
HCC Disease Group	**Label**	**HCC Disease Group**	**Label**
17	Diabetes with Ketoacidosis	19	Diabetes without Complications

Factor 1: Diabetes with Ketoacidosis, HCC17 = 0.339
Factor 2: Diabetes without Complications, HCC19 = 0.162

Risk Score = (demographics) + 0.339

70.2.7 - Disease and Disabled Interactions

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Disease Interactions - Certain combinations of coexisting diagnoses for an individual can increase medical costs more than the additive nature of the CMS-HCC model reflects. The CMS-HCC model recognizes these higher costs by incorporating disease interactions in the model.

Disabled Interactions - Interactions between certain diseases and disabled status for an enrollee can increase medical costs. The CMS-HCC model recognizes these higher costs by incorporating disease and disabled interactions in the model.

In calculating the interaction part of the risk score for an individual, the disease or disabled interaction factor is added to the remaining factors.

The following example uses the CMS-HCC risk adjustment model used in payment for years 2009 through 2011:

An individual who is disabled, lives in the community, and has been diagnosed with rheumatoid arthritis (ICD-9 code 7140, HCC38) and cystic fibrosis (ICD-9 code 2770, HCC107).

Factor 1: Rheumatoid Arthritis and Inflammatory Connective Tissue, HCC38 = 0.346
Factor 2: Cystic Fibrosis, HCC107 = 0.399
Factor 3: Disabled * Cystic Fibrosis, D_HCC107 = 1.097

Risk Score = (demographics) + 0.346 + 0.399 + 1.097