What DRG versions available in CHIA Inpatient Case Mix Data?

Review: Definition of DRG Diagnosis Related Group

A classification system that groups patients according to diagnosis, type of treatment, age, and other relevant criteria. Under the prospective payment system, hospitals are paid a set fee for treating patients in a single DRG category, regardless of the actual cost of care for the individual.

Source: CMS http://www.cms.gov/apps/glossary/default.asp

Over the Past 30 years Multiple Versions of DRGs have been Created and Refined

The Three Most Commonly Used DRGs Decade (2004-2015) in HDD

- All Patients Diagnosis Related Groups
  AP-DRG

- All Patients Refined Diagnosis Related Groups
  APR-DRG

- Medicare (CMS) Diagnosis Related Groups
  CMS-DRG

26 Year (1988-2015) History of Diagnosis Related Group (DRG) Versions in Massachusetts Inpatient Hospital Discharge Data (HDD)

| HDD Fiscal Year	AP-DRG Version 12	AP-DRG Version 14.1	AP-DRG Version 18	AP-DRG Version 21	AP-DRG Version 25.1	APR-DRG Version 12	APR-DRG Version 15	APR-DRG Version 20	APR-DRG Version 26.1	APR-DRG Version 30	Former HCFA (now CMS) DRG Version 2	Former HCFA (now CMS) DRG Version 8	VHAF-DRG Version 24	VHAF-DRG Version 25	CMS-DRG Version 26	CMS-DRG Version 27	CMS-DRG Version 28	CMS-DRG Version 29	CMS-DRG Version 30	CMS-DRG Version 31	CMS-DRG Version 32
2015								x	x	x											x
2014								x	x	x										x	
2013				x	x			x	x	x									x		
2012				x	x			x	x	x								x			
2011				x	x			x	x	x							x				
2010				x	x			x	x	x						x					
2009				x	x			x	x	x				x							
2008	x			x				x						x							
2007	x			x				x					x								
2006	x	x	x	x			x														
2005	x	x	x				x														
2004	x	x	x				x														
2003	x	x	x				x														
2002	x	x	x				x														
2001	x	x	x				x														
2000	x	x	x				x					x									
1999	x	x	x			x	x					x									
1998	x	x	x			x	x					x									
1997	x	x	x			x	x					x									
1996	x	x	x			x	x					x									
1995	x	x	x			x	x					x									
1994	x	x	x			x	x					x									
1993	x					x						x									
1992	x					x						x									
1991	x					x					x	x									
1990	x					x					x	x									
1989	x										x	x									
1988											x	x									

What is the difference between the DRG versions?

AP-DRG History and Massachusetts HDD Use Timeline

All Patients Diagnosis Related Groups (**AP-DRG**) was developed in 1987 through agreement between New York State Department of Health and 3M Health Information Systems Software in conjunction with the National Association of Children's Hospitals and Related Institutions. AP-DRGs are similar to original DRGs developed by Yale University for CMS, but also include a more detailed DRG breakdown for non-Medicare patients, particularly newborns and children. Its development was driven by legislation instituting DRG-prospective payment for all **non-Medicare patients** and evaluated to ensure its applicability to **neonatal, pediatric patients** and **patients with HIV**. The features of AP-DRG categories recognize **resource intensity*** associated with:

- Six Distinct Neonate Birth Weight Ranges
- HIV in the presence or absence of 12 related infections
- Complications and Comorbidities / Transplant Status
- Differentiation of Forms of Substance Abuse
- Pediatric modifications associated with, for example, lead poisoning and congenital anomalies

Timeline of AP-DRG Use in Massachusetts HDD
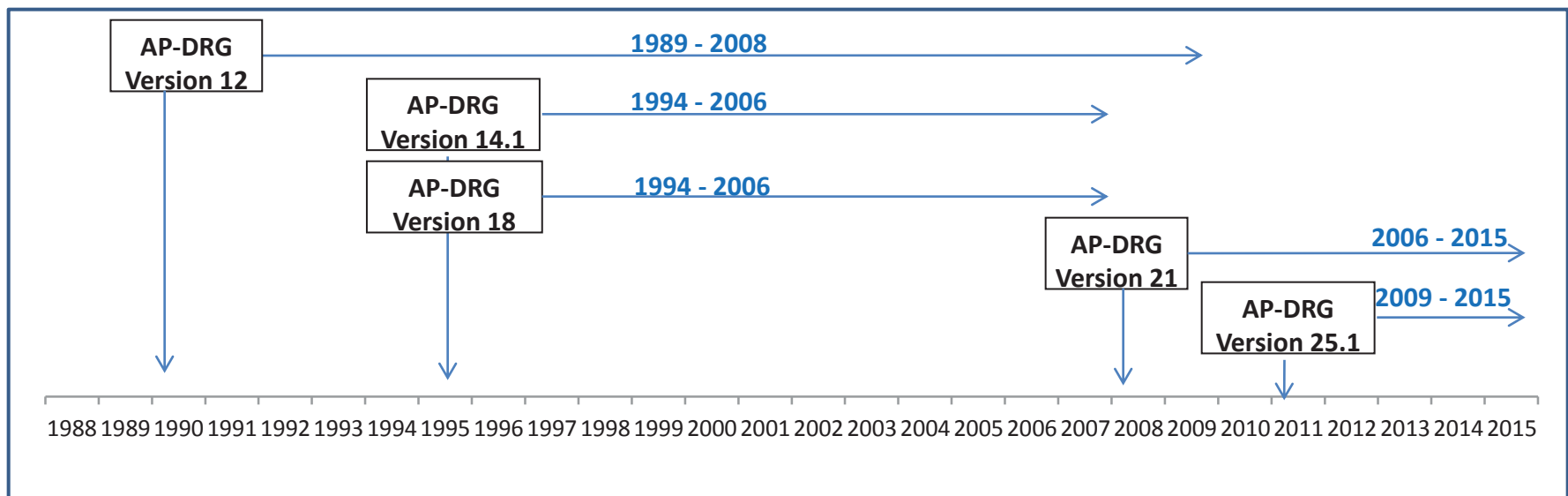
Definition of Resource Intensity - *The relative volume and types of diagnostic, therapeutic, and bed services used in the management of a particular disease. (source: AHRQ   https://www.hcup-us.ahrq.gov/db/nation/nis/APR-DRGsV20MethodologyOverviewandBibliography.pdf)*

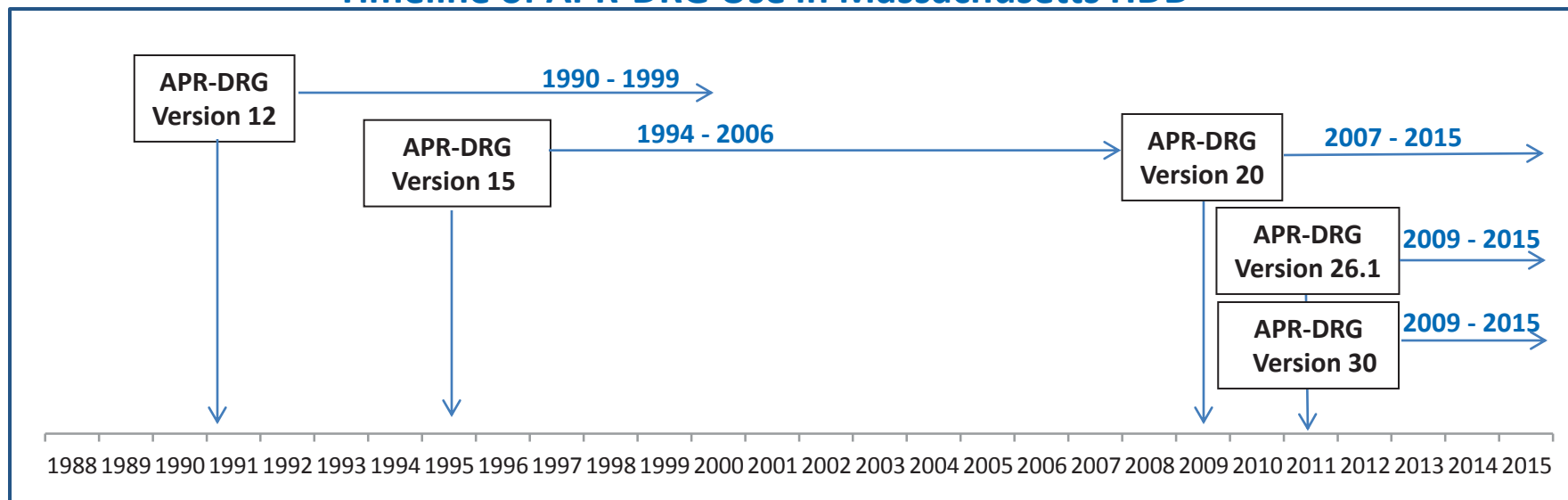# APR-DRG History and Massachusetts HDD Use Timeline

All Patients Refined Diagnosis Related Groups (**APR-DRG**), developed in 1990, shifts focus of DRGs from institutional resource intensity to case mix demographics, clinical complications and comorbidities, and multiple diagnoses. Existing resource intensity DRGs did not address severity of illness, risk of mortality, and the impact and interaction of multiple diagnoses on treatment difficulty. While CMS later created an MS-DRG severity adjustment to CMS-DRG, it only adjusts for single complicating factors while APR-DRG is more effective in grouping by the true complexity of multiple additional comorbidities or complications with and without their added impact on resource use. The APR-DRG includes:

•Four severity of illness subgroups (Minor, Moderate, Major, Extreme)
•Four risk of mortality subgroups (Minor, Moderate, Major, Extreme)
•Each of the above subgroup assignments take into consideration secondary diagnosis, interaction between secondary diagnosis, age, principal diagnosis, complications, comorbidities, OR and non-OR procedures.

Focus of APR-DRG on interaction of factors
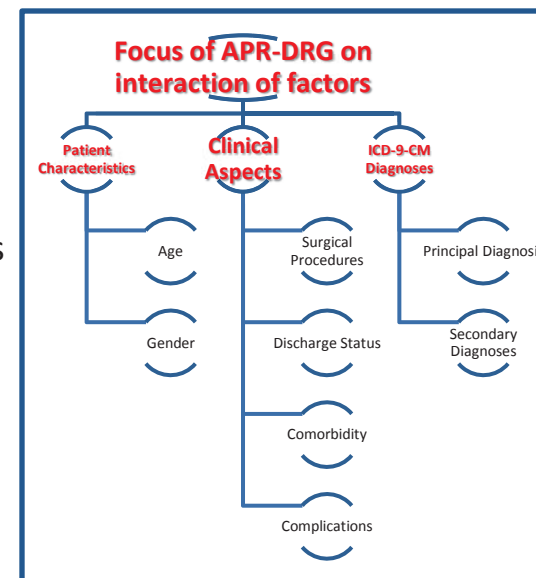
More than 50% of U.S. hospitals use APR-DRG. CMS contracted with RAND to evaluate severity-adjusted of 5 different DRG systems APR-DRG ranked superior to all other DRG classification systems.*

Timeline of APR-DRG Use in Massachusetts HDD

* *Wynn BO, Scott M: Evaluation of Severity-Adjusted Systems. Prepared for the CMS July 2007, RAND Health.*
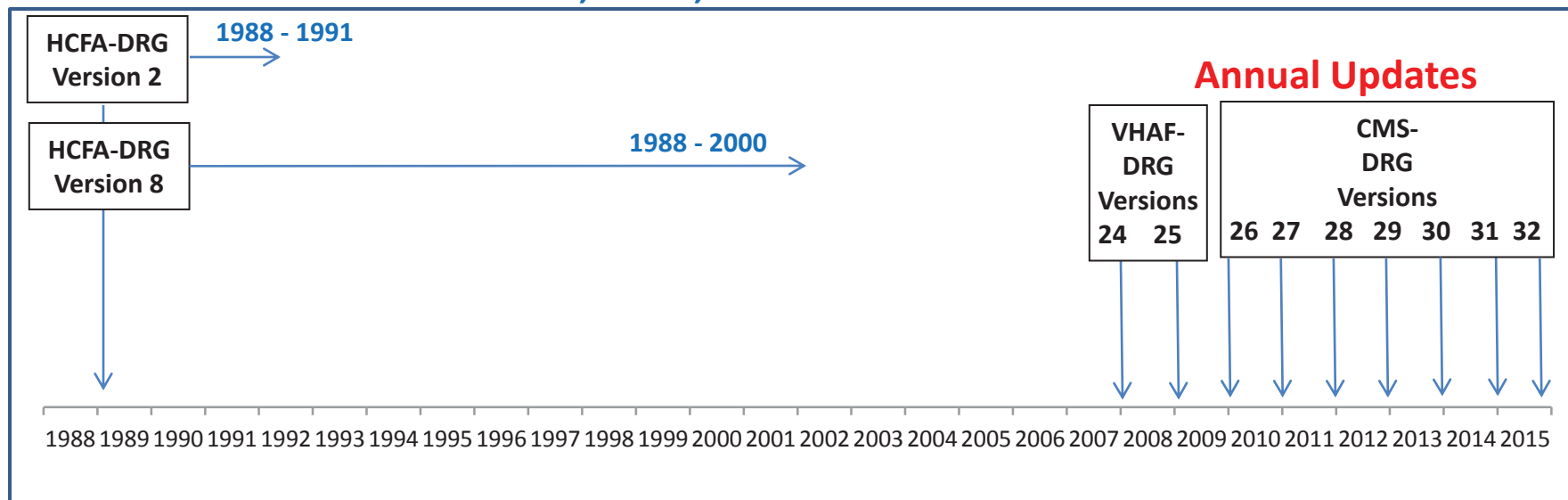
CMS-DRG History and Massachusetts HDD Use Timeline

The Health Care Financing Administration (HCFA), the predecessor agency to the Centers for Medicare and Medicaid Services, implemented **HCFA-DRGs** in 1983 to measure inpatient resource consumption by the Medicare population. The core of their DRG system was the healthcare "product" supplied by hospital care of a patient. The initial architects of the CMS-DRG system established 23 major diagnostic categories (MDCs) as the first level of categorizing these products.* The MDCs were then subdivided into DRGs based on factors such as surgical status, organ system, age, symptoms, comorbidities, and discharge status. While subsequent modifications to the Medicare DRGs included non-Medicare patients, the key focus of modifications has been on problems relating primarily to the elderly population. The Veterans Health Administration **VHAF-DRG** is based on the CMS-DRG with refinements by 3M for severity in the veterans population and non-veteran population.

How CMS-DRGs differ from APR-DRGs?**

Usage	CMS DRG Development	3M APR DRG Development
Medicare population representation		
Non-Medicare population representation		
Severity-of-Illness analysis		
Recognition of the impact of MULTIPLE secondary diagnoses, their severity, and their interactions		
Mortality analysis		
Variation in mortality rates within a DRG (e.g. CVA w/ infarct vs. intracranial bleed)		

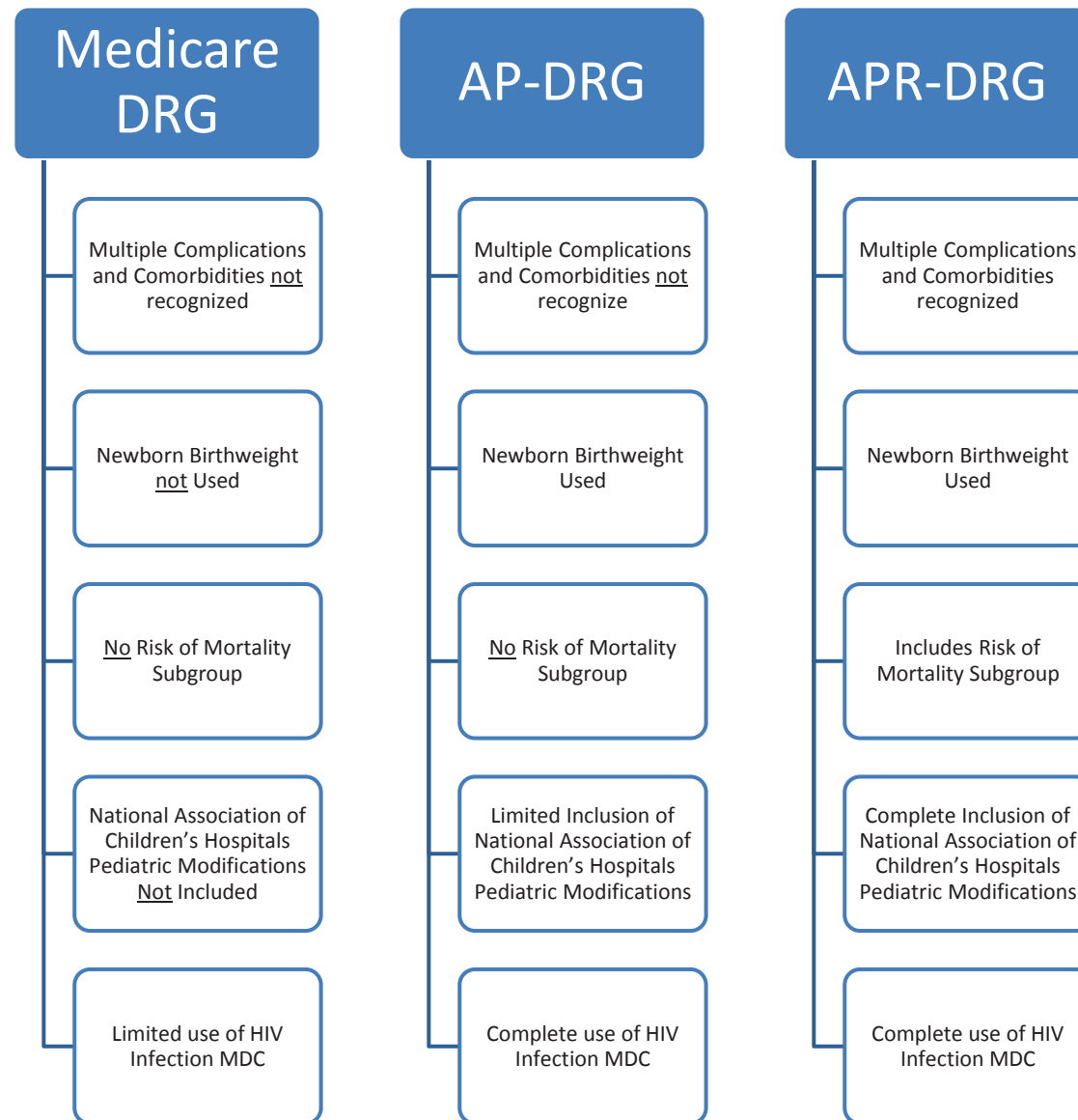## Timeline of HCFA, VHAF, and CMS DRG Use in Massachusetts HDD

HCFA-DRG Version 2 — 1988 - 1991

HCFA-DRG Version 8 — 1988 - 2000

Annual Updates

VHAF-DRG Versions 24 25

CMS-DRG Versions 26 27 28 29 30 31 32

1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

*   Source: Dr. Brandon Bushnell: The Evolution of DRGs. American Academy of Orthopedic Surgeons, http://www.aaos.org/news/aaosnow/dec13/advocacy2.asp
** Source: All Patient Refined DRGs, a Methodology Overview, 2006, 3M HIS, https://msmedicaid.acs-inc.com/trainingMaterials/MSAPR-Methodology.pdf

Comparison of Some Structural* Differences between Medicare-DRG, AP-DRG, APR-DRG Versions 12

Medicare DRG	AP-DRG	APR-DRG
Multiple Complications and Comorbidities not recognized	Multiple Complications and Comorbidities not recognize	Multiple Complications and Comorbidities recognized
Newborn Birthweight not Used	Newborn Birthweight Used	Newborn Birthweight Used
No Risk of Mortality Subgroup	No Risk of Mortality Subgroup	Includes Risk of Mortality Subgroup
National Association of Children's Hospitals Pediatric Modifications Not Included	Limited Inclusion of National Association of Children's Hospitals Pediatric Modifications	Complete Inclusion of National Association of Children's Hospitals Pediatric Modifications
Limited use of HIV Infection MDC	Complete use of HIV Infection MDC	Complete use of HIV Infection MDC

Source: 3M Health Information Systems Research Report No. 5-98