

¹Puerto Rico Central Cancer Registry at the Comprehensive Cancer Center of the University of Puerto Rico; ² Cancer Control and Population Sciences Program, University of Puerto Rico
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BACKGROUND

- Death Clearance (DCL) is an activity designed to assess and improve overall registry quality by using information from death certificates to identify unreported cancer (Ca) cases and update database records.
- Unreported cases include those identified by death certificate only (DCO). The percentage of these cases is used as a measure of completeness by the North American Association of Central Cancer Registries (NAACCR).
- The goal of NAACCR's Death Clearance Manual is to promote consistency in DCL process among registries by including minimum requirements, best practices, and guidelines.
- Some of the minimum requirements for this process are the evaluation of the underlying cause of death (COD) and perform a match between incidence and death certificate databases at patient level.
- Since 2004, the Puerto Rico Central Cancer Registry (PRCCR) signed a collaborative agreement with the Puerto Rico Demographic Registry (PRDR) to receive annually a copy of the electronic death certificates (DC) file that includes the underlying COD and up to three contributing causes of death.

PURPOSE

Assess the impact on PRCCR completeness by reviewing death certificate's multiple causes of death versus the underlying COD in death clearance process for the period 2009-2013.

METHODS

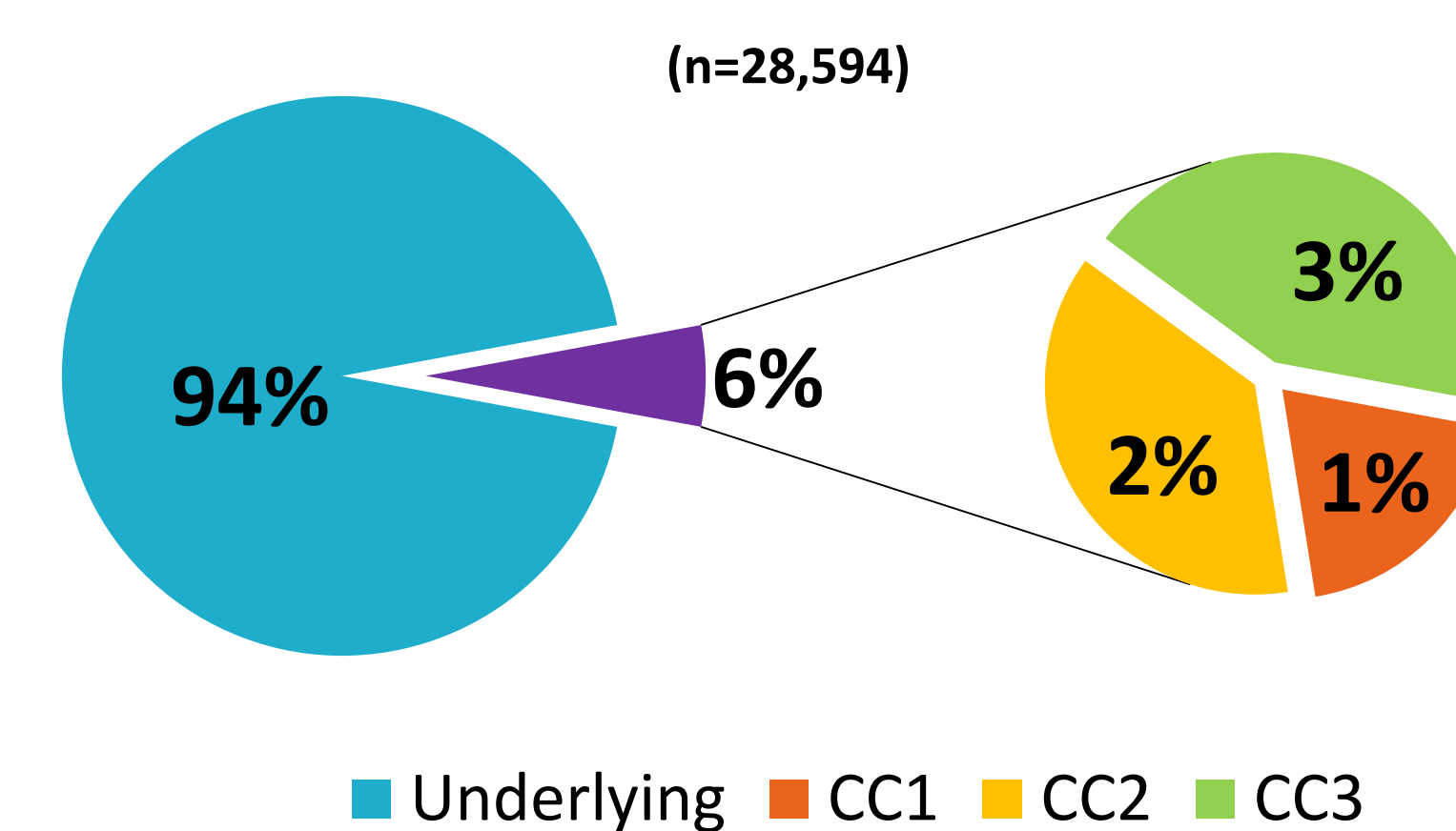
- Annually, PRCCR receives the mortality file from PRDR for all deaths in Puerto Rico. Each DC includes multiple causes of death (up to four).
- Appendix D of DCL Manual was used to identify death certificates with reportable conditions, considering all of the available causes of death.
- Match between DC database and cancer database was done at patient and tumor level considering common metastatic sites.
- Follow back was performed for all non-matched cases and eventually classified as not reportable, death certificate only (DCO), or missed incidence cases (MIC).
- To quantify missed incidence cases, follow back cases were flagged with Death Certificate Notification (DCN) as established in the manual for 2013 death clearance process.
- Results from death clearance process were grouped and analyzed for each available cause of death (underlying and three contributing causes (CC1-CC3)).

RESULTS

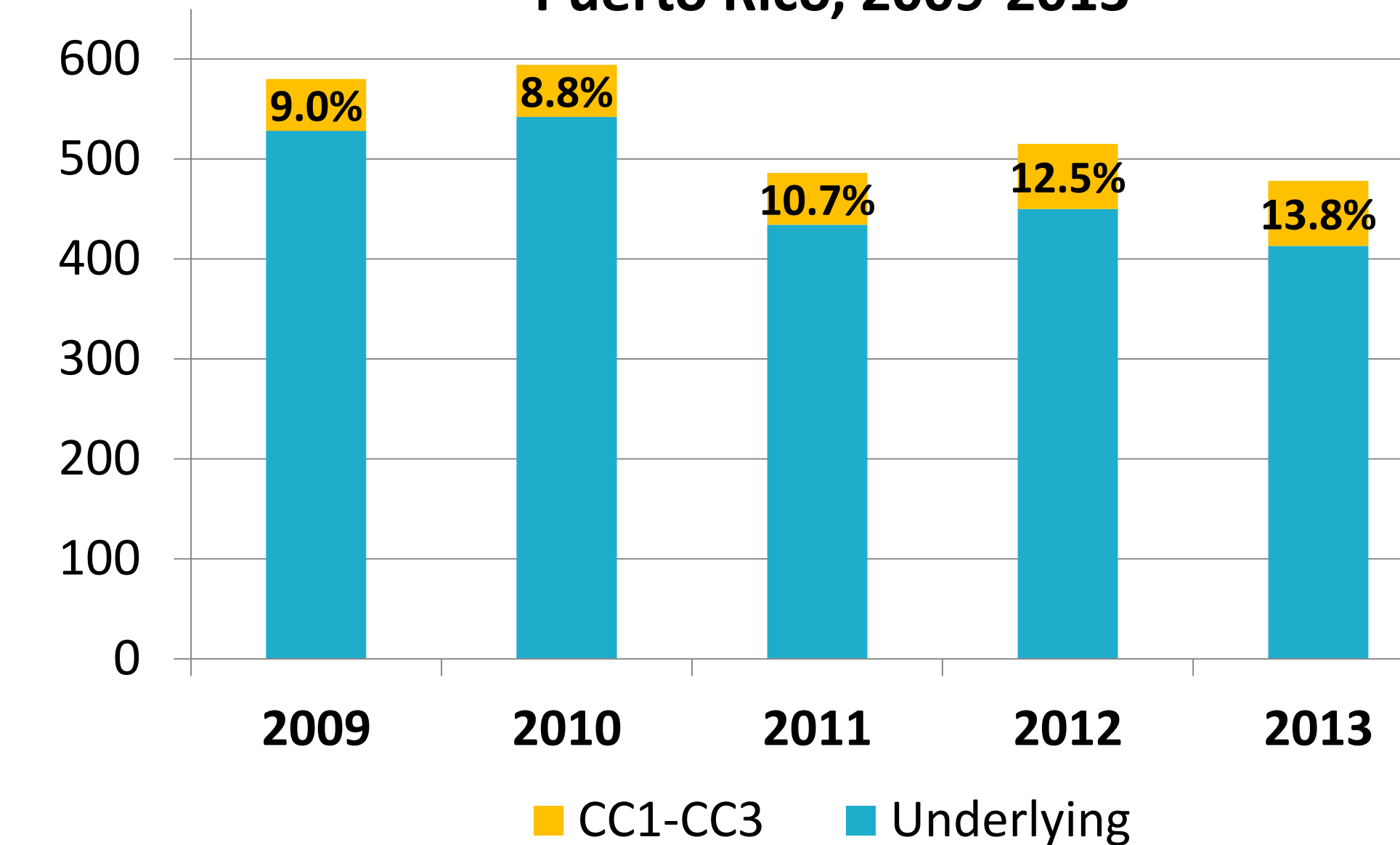
Death Certificates by Multiple Cancer Related Causes of Death Available and DCO: Puerto Rico, 2009-2013

Dx Year	Total DC	Cancer related COD				DCO		
		Underlying	CC1	CC2	CC3	Underlying	CC1-CC3	Total DCO
2009	29,125	5,257	80	120	128	527	52	579
2010	29,300	5,345	49	129	130	540	52	592
2011	29,622	5,390	61	112	131	434	52	486
2012	29,890	5,558	79	118	146	455	65	520
2013	29,368	5,378	57	147	179	407	65	472
TOTAL	147,305	26,928	326	626	714	2,363	286	2,649

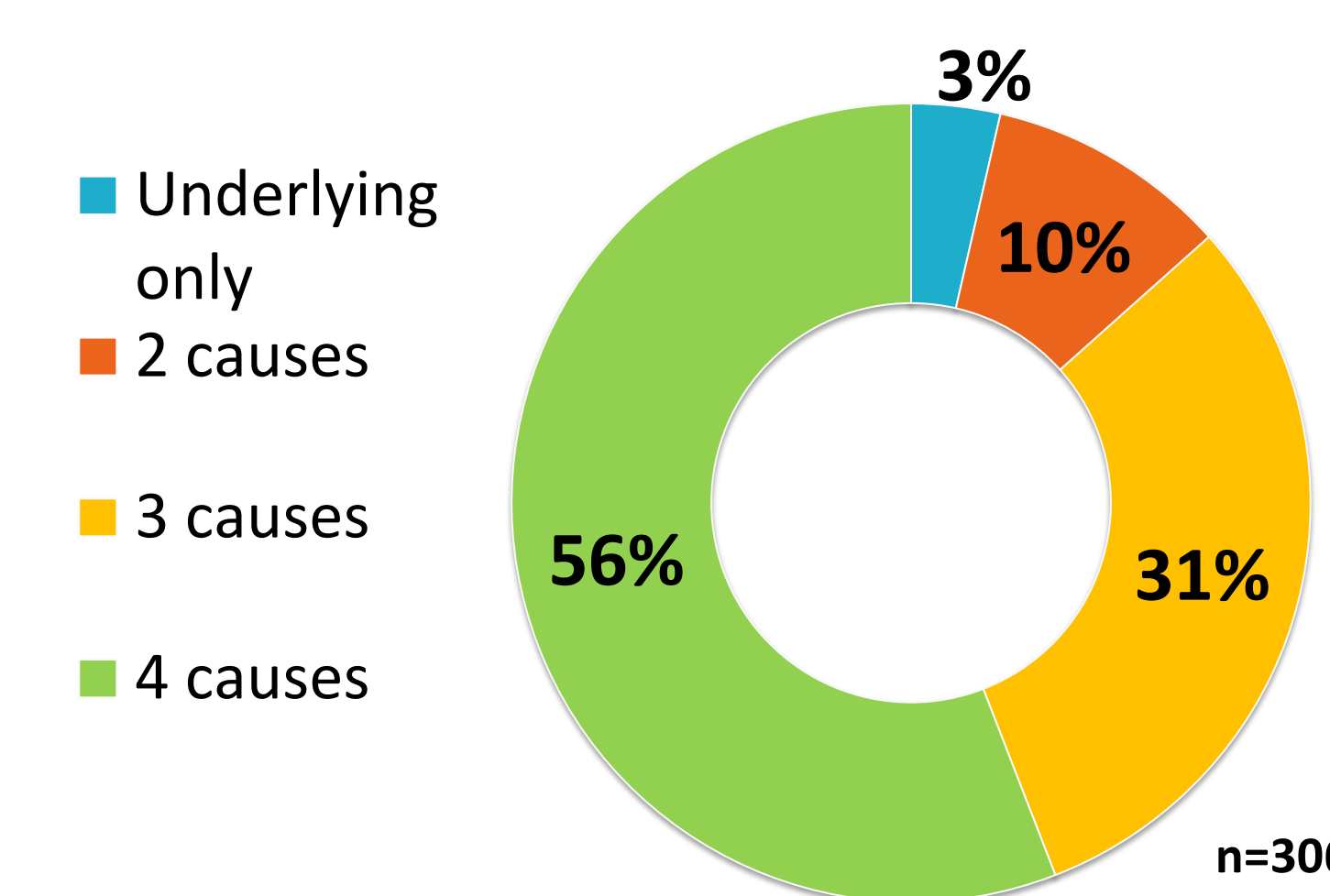
Cancer Related Causes of Death at Underlying and Contributing Causes of Death: Puerto Rico, 2009-2013



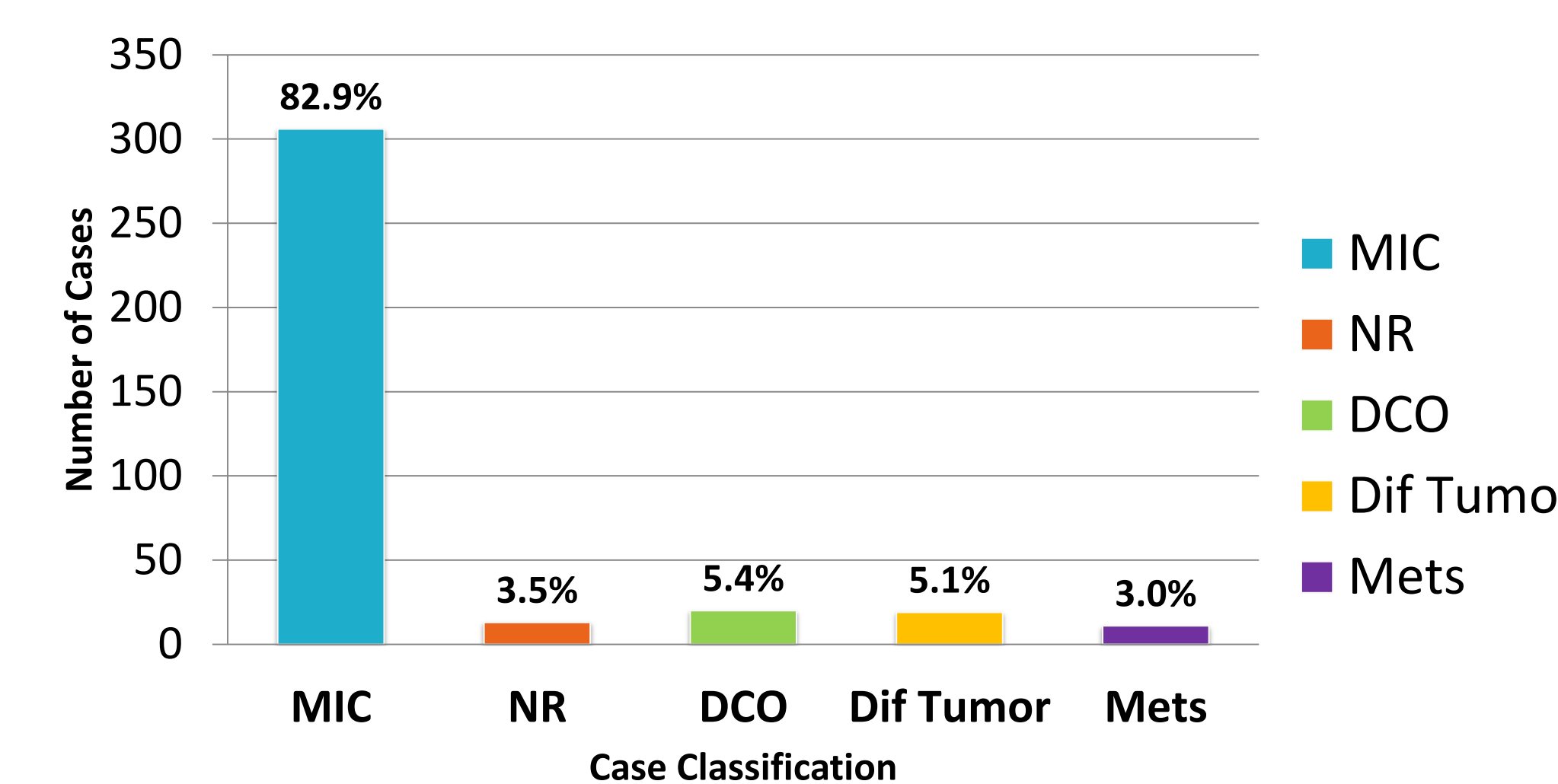
Annual Distribution of DCO Cases by COD: Puerto Rico, 2009-2013



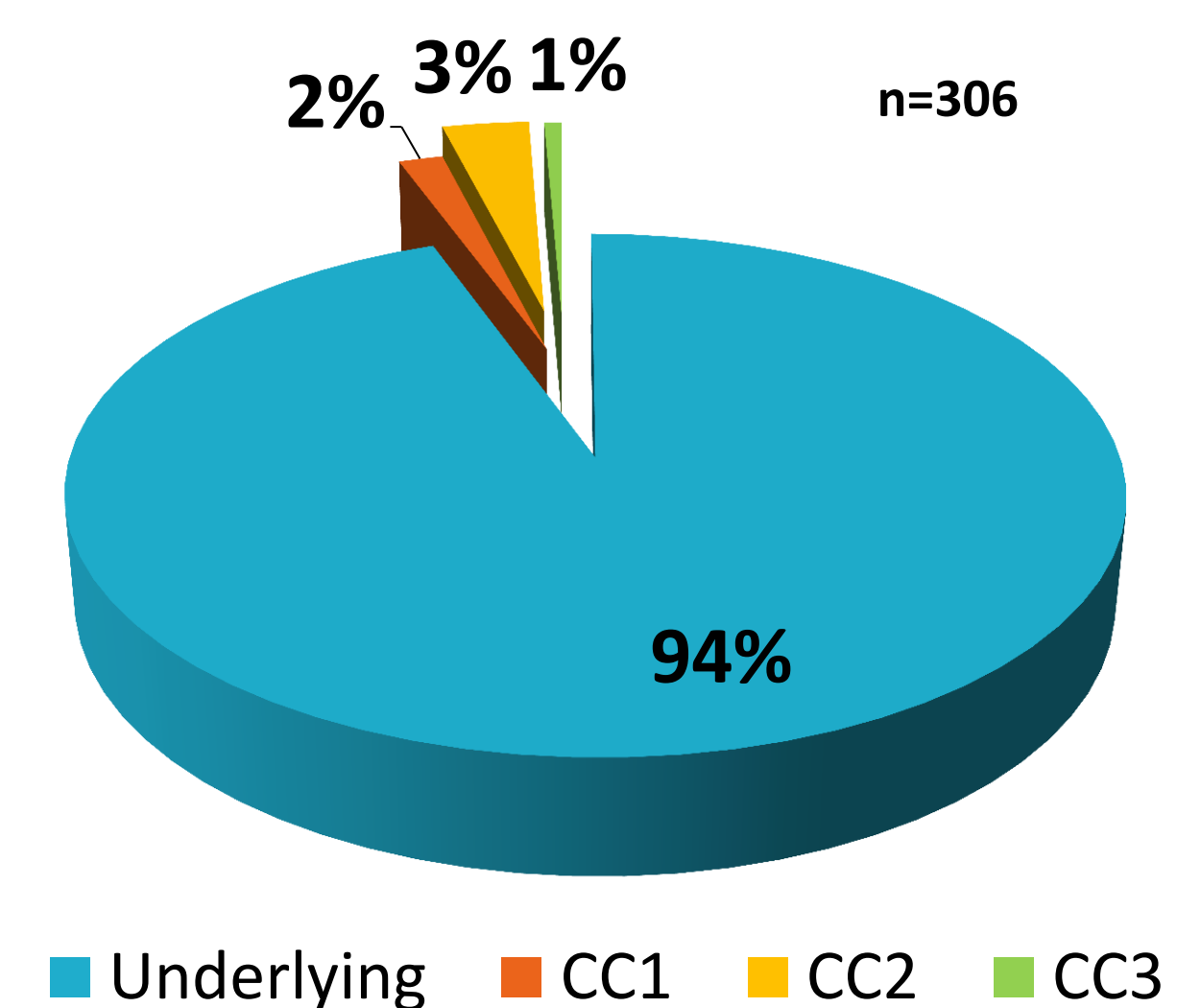
Distribution of Causes of Death Available in Missed Incidence Cases (MIC): Puerto Rico, 2013



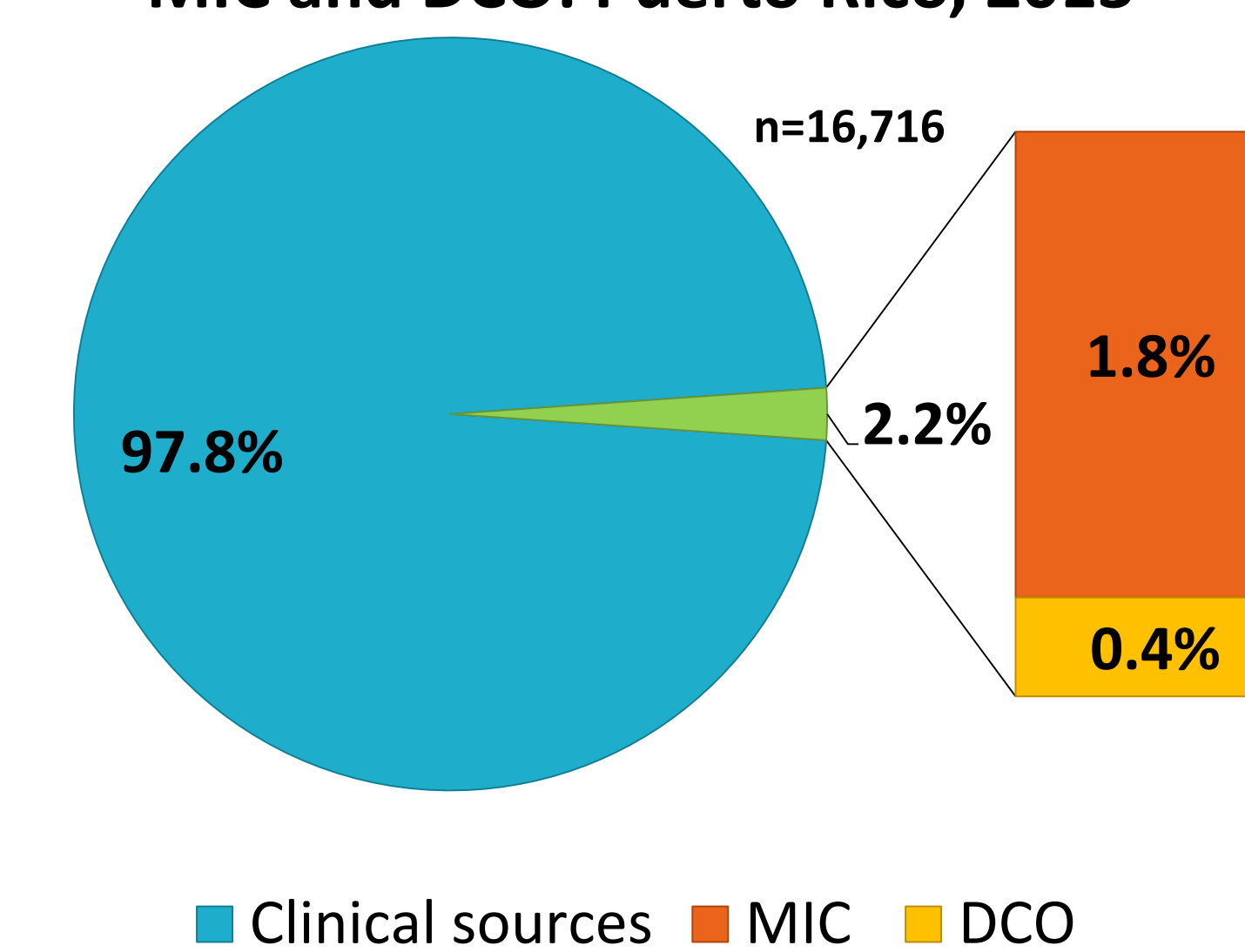
Distribution of Death Certificate Notification Cases: Puerto Rico, 2013



Distribution of Missed Incidence Cases by COD: Puerto Rico, 2013



Distribution of cancer cases by Clinical Sources, MIC and DCO: Puerto Rico, 2013



RESULTS

- For 2009-2013, PRCCR received 147,305 electronic DC from which approximately 20% (28,594) had Ca related ICD codes in any of the 4 causes of death.
- Approximately, 6% (n=1,666) had Ca related ICD code in any of the 3 contributing causes of death only: 1% (326) in CC1, 2% (626) in CC2 and 3% (714) CC3.
- For this period, an average of 3.4% (n=530) were DCO cases. In 2009 the highest DCO was reported at 4.2% and the lowest in 2013, 3.0%.
- DCO cases identified from contributing causes of death represent, in average, 0.4% (57) of all Ca cases for this period: 67.1% (355) of DCO cases were identified at the underlying COD, 4.2% (22) at CC2 and CC3 each and 2.5% (13) at CC1.
- For the year 2013, follow back was performed on 371 cases of which 82.9% (306) resulted in MIC, 5.4% (20) DCO, 3.5% (13) not reportable, 3.0% (11) metastasis and 5.1% (19) were not received and PRCCR matched it to existing patient (not DCO).
- Of the 306 MIC cases, 56% (171) had four causes of death available, 31% (94) had 3 causes, 10% (30) two causes, and 3% (11) had only the underlying COD.
- Of all MIC, 93% (239) had a Ca related COD in the underlying COD, 4% (10) in CC2, 2% (5) in CC1, and 1% (2) in CC3.

DISCUSSION

- The consideration of contributing causes of death has impacted the PRCCR's death clearance process by allowing identification of additional cases adding to DCO percentage as well as completeness. Especially, for 2013 when PRCCR achieved NAACCR's Silver certification with 91.1% completeness and 2.9% DCO cases.
- By considering contributing causes, most DCO cases recovered for 2009-2013 had Ca related code on CC2 and CC3. In 2013, of the 306 MIC, 6% had Ca related code in CC1-CC3.
- The review of contributing causes of death represents additional workload for PRCCR staff however, the results support the review of multiple causes of death as best practice for death clearance process.
- These results justify maintaining the PRCCR and PRDR agreement to receive up to four causes of death per death certificate.
- The high number of MIC for year 2013 reflect a deficiency in sources' case finding efforts and calls for action to assure a complete and timely reporting of cases to PRCCR.
- The addition of DCN flag, which started in 2013, permitted the quantification of MIC and allowed the present evaluation of PRCCR's death clearance process. Additional flags were identified as possible additions to PRCCR DCL process to allow easier and more extensive evaluation (e.g.; existing patient(not DCO) and metastasis).
- Future considerations include: identifying common primary sites through DC only; evaluating the impact of contacting non-clinical sources to obtain contact information for follow back; and evaluating other best practices and guidelines suggested by the DCL Manual for implementation at the PRCCR.