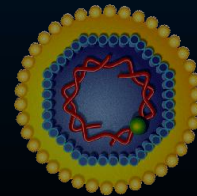
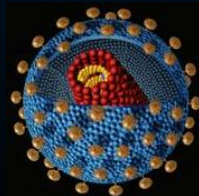




MODELED ESTIMATES OF HIV-HCV AND HIV-HBV COINFECTION CANADA 2008

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1st Canadian HIV/HBV/HCV Co-infection Research Summit
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Modeling HIV-HCV and HIV-HBV coinfection Background



- Hepatitis B virus discovered in 1965
- HIV serologic testing available since 1985
- HCV serologic testing available since 1990
- HBV, HCV and HIV share common routes of transmission
- Immediately apparent that some populations at high risk for HIV also at risk for HCV
- In 2002, we modelled the epidemiology of HIV-HCV co-infection under contract for Health Canada

Modeling HIV-HCV and HIV-HBV coinfection

Methods



- In collaboration with expert panel, estimated the proportion of HIV-infected persons in each exposure category also infected with HCV
- Recently estimated proportion of HIV-infected persons in each exposure category also infected with HBV based on literature review
- Applied proportion to Ontario HIV modelled prevalence estimates 2008 (and before)



HIV-HCV coinfection

Modeled HIV-HCV coinfection by exposure category, Canada, 2008



	Number HIV-infected	Proportion HCV	Number HCV-infected	Proportion in Canada
MSM	31,330	4.2%	1,316	10.0%
MSM-IDU	2,030	82.0%	1,665	12.7%
IDU	11,180	83.0%	9,279	70.7%
HIV-endemic	9,250	1.5%	139	1.1%
Heterosexual	10,710	2.6%	278	2.1%
Other	500	90.0%	450	3.4%
Total	65,000	20.2%	13,127	100%

Modeled HIV-HCV coinfection by exposure category, Ontario, 2008



	Number HIV-infected	Proportion HCV	Number HCV-infected	Proportion in Ontario
MSM	15,073	4.2%	633	20.4%
MSM-IDU	617	82.0%	506	16.3%
IDU	1,988	83.0%	1,650	53.2%
HIV-endemic	4,878	1.5%	73	2.4%
Heterosexual	3,920	2.6%	102	3.3%
Other	151	90.0%	136	4.4%
Total	26,627	11.6%	3,100	100%

Modeled HIV-HCV coinfection by health region, Ontario, 2008



	Number HIV-infection	Proportion HCV	Number HCV-infected	Proportion in Ontario
Toronto	16,665	8.8%	1,465	47.3%
Ottawa	3,170	17.9%	566	18.3%
Central East, other	1,835	10.3%	190	6.1%
Eastern, other	660	26.8%	177	5.7%
Central West	1,995	14.9%	297	9.6%
Southwest	1,645	11.1%	183	5.9%
Northern	665	32.6%	217	7.0%
Total	26,630	11.6%	3,100	100%

Modeled HIV-HCV coinfection by exposure category, Toronto, 2008



	Number HIV-infected	Proportion HCV	Number HCV-infected	Proportion in Toronto
MSM	10,730	4.2%	451	30.8%
MSM-IDU	325	82.0%	267	18.2%
IDU	685	83.0%	569	38.8%
HIV-endemic	2,860	1.5%	43	2.9%
Heterosexual	1,970	2.6%	51	3.5%
Other	95	90.0%	86	5.8%
Total	16,665	8.8%	1,465	100%

Number of HIV-HCV coinfections by exposure category, Canada, 2002, 2005 and 2008



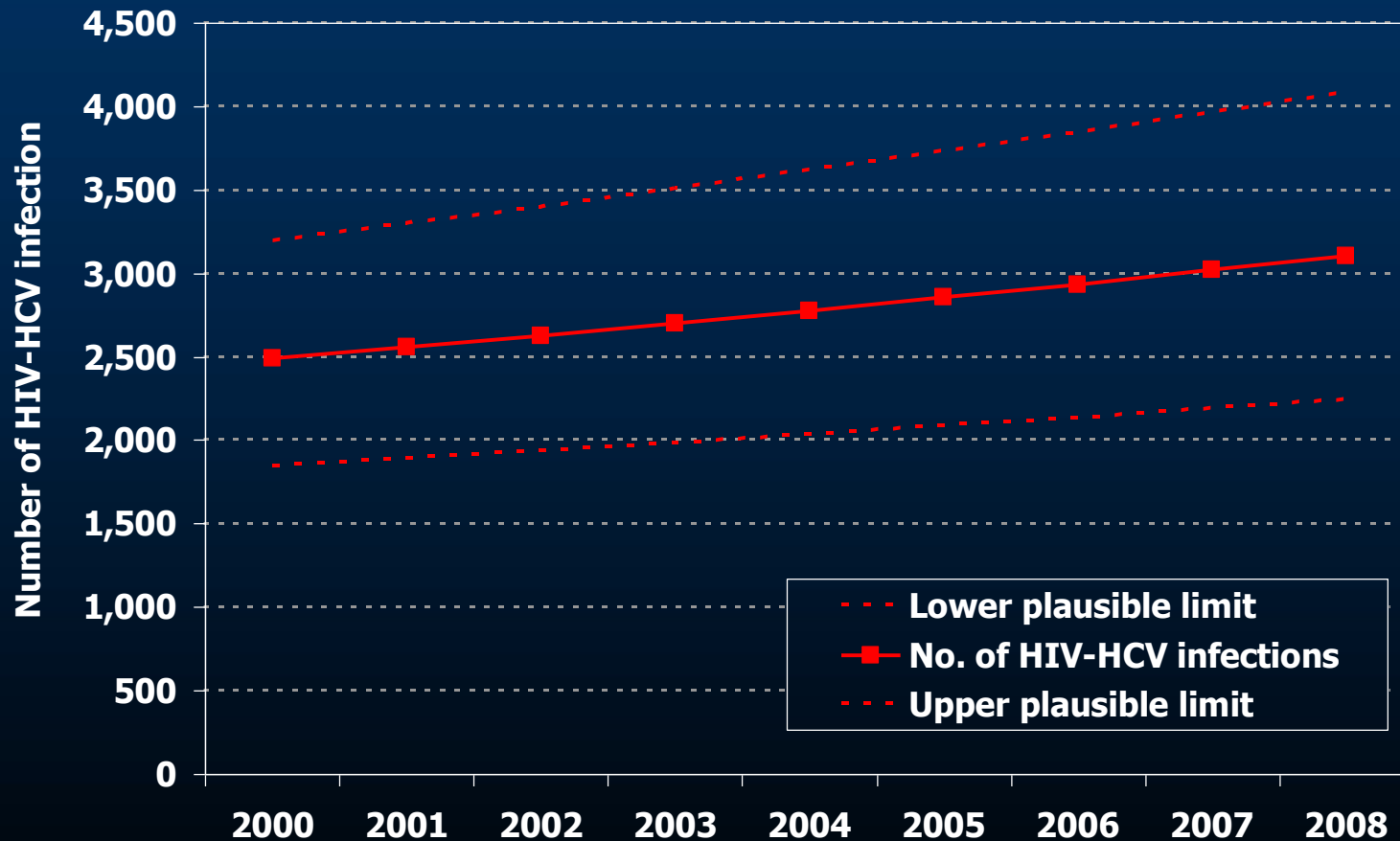
	2002	2005	2008
MSM	1,100	1,243	1,316
MSM-IDU	1,558	1,845	1,665
IDU	7,387	8,184	9,279
HIV-endemic	85	106	139
Heterosexual	181	224	278
Other	315	360	450
Total	10,626	11,962	13,127

Number of HIV-HCV coinfections by exposure category, Ontario, 2002, 2005 and 2008

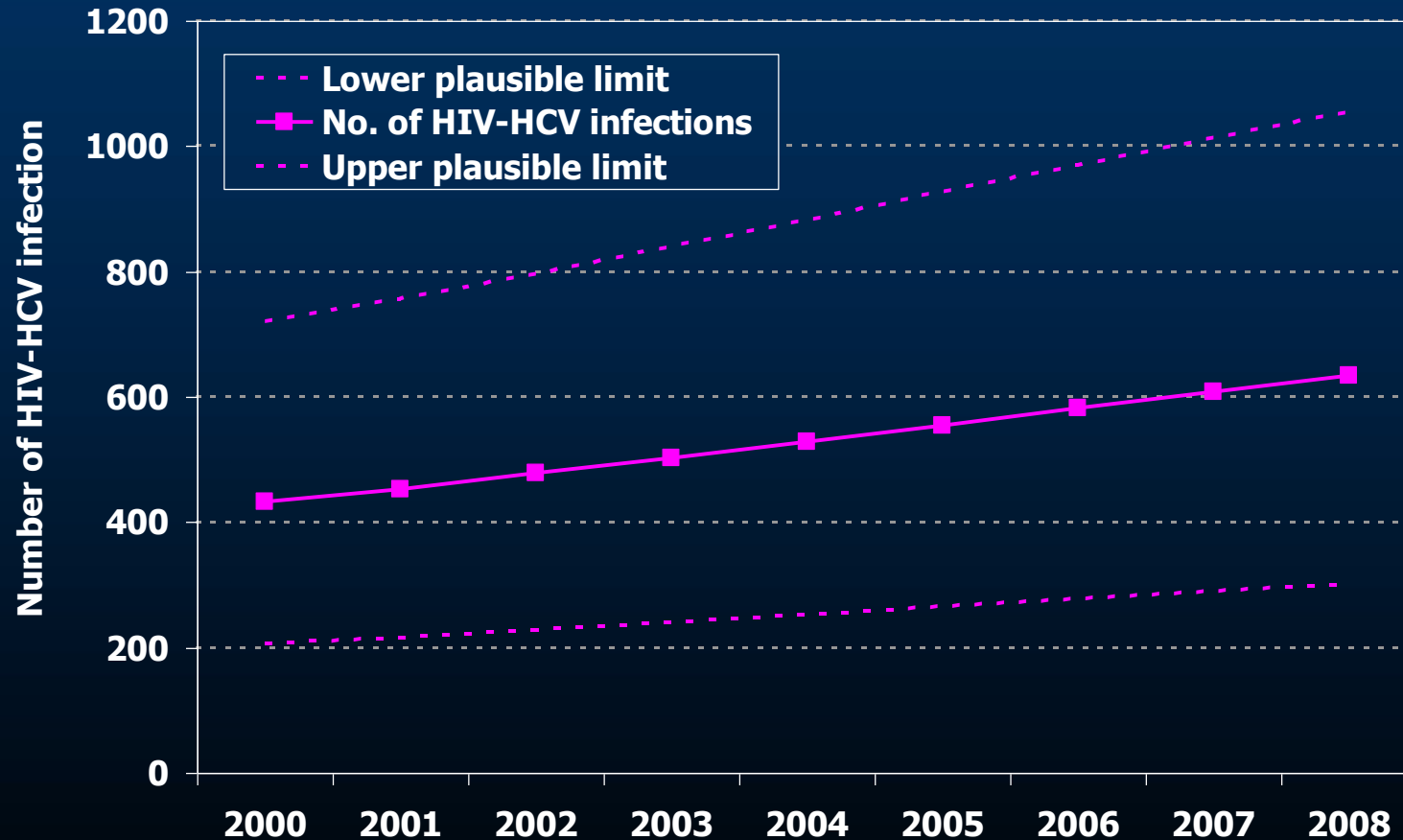


	2002	2005	2008
MSM	478	555	633
MSM-IDU	410	459	506
IDU	1,470	1,551	1,650
HIV-endemic	40	56	73
Heterosexual	66	84	102
Other	161	147	136
Total	2,625	2,852	3,100

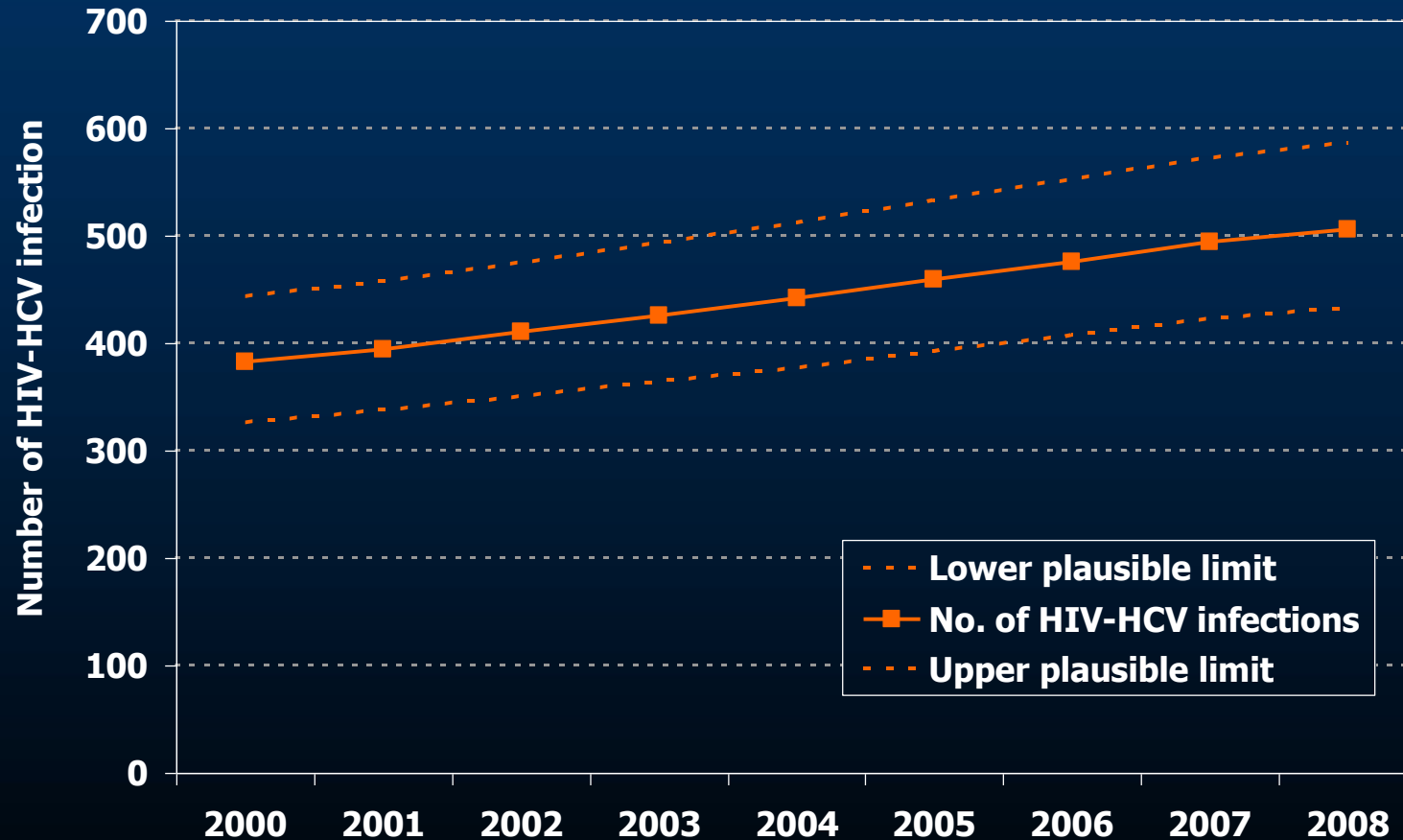
Modeled HIV-HCV coinfection Ontario, 2000-2008



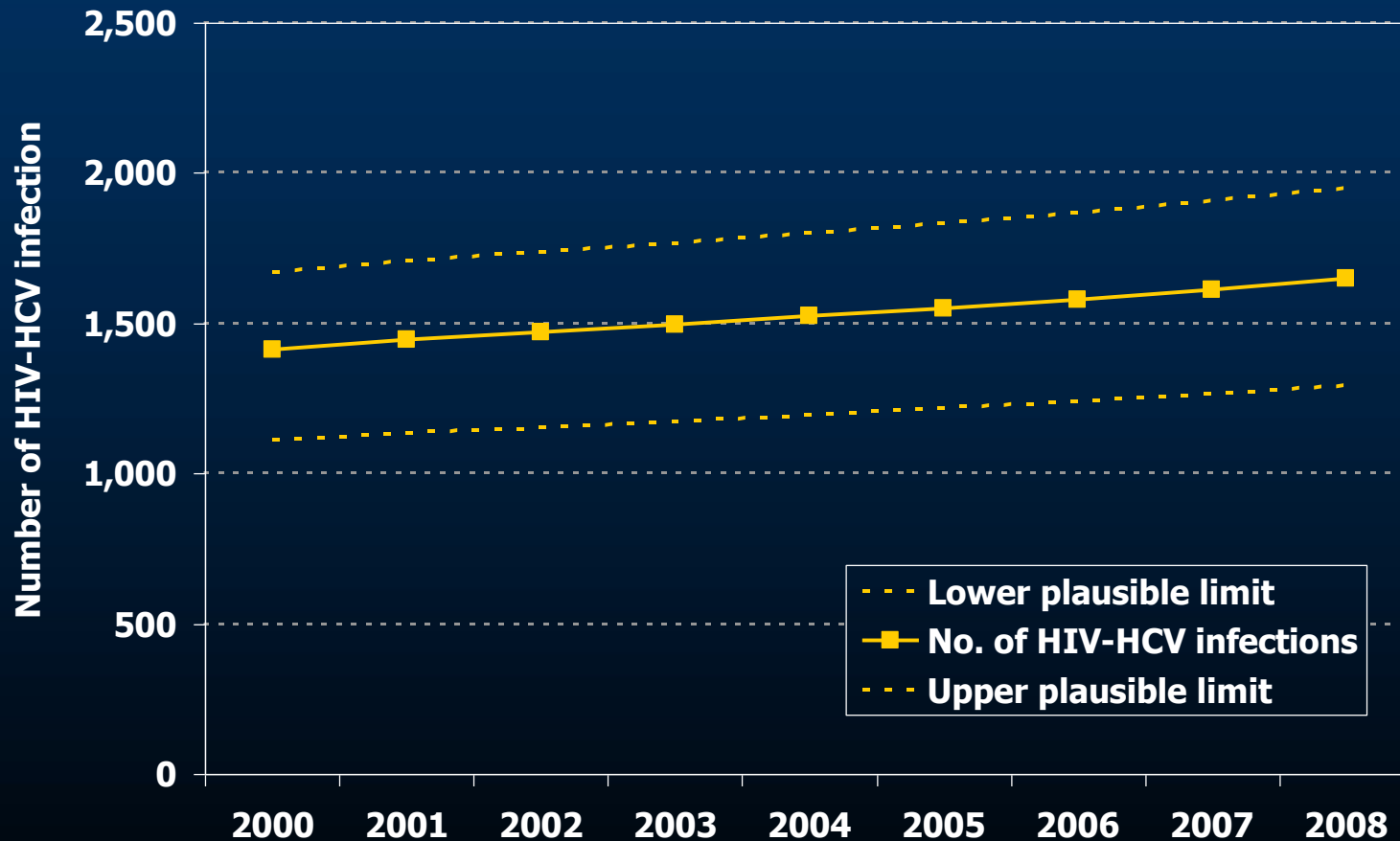
Modeled HIV-HCV coinfection MSM, Ontario, 2000-2008



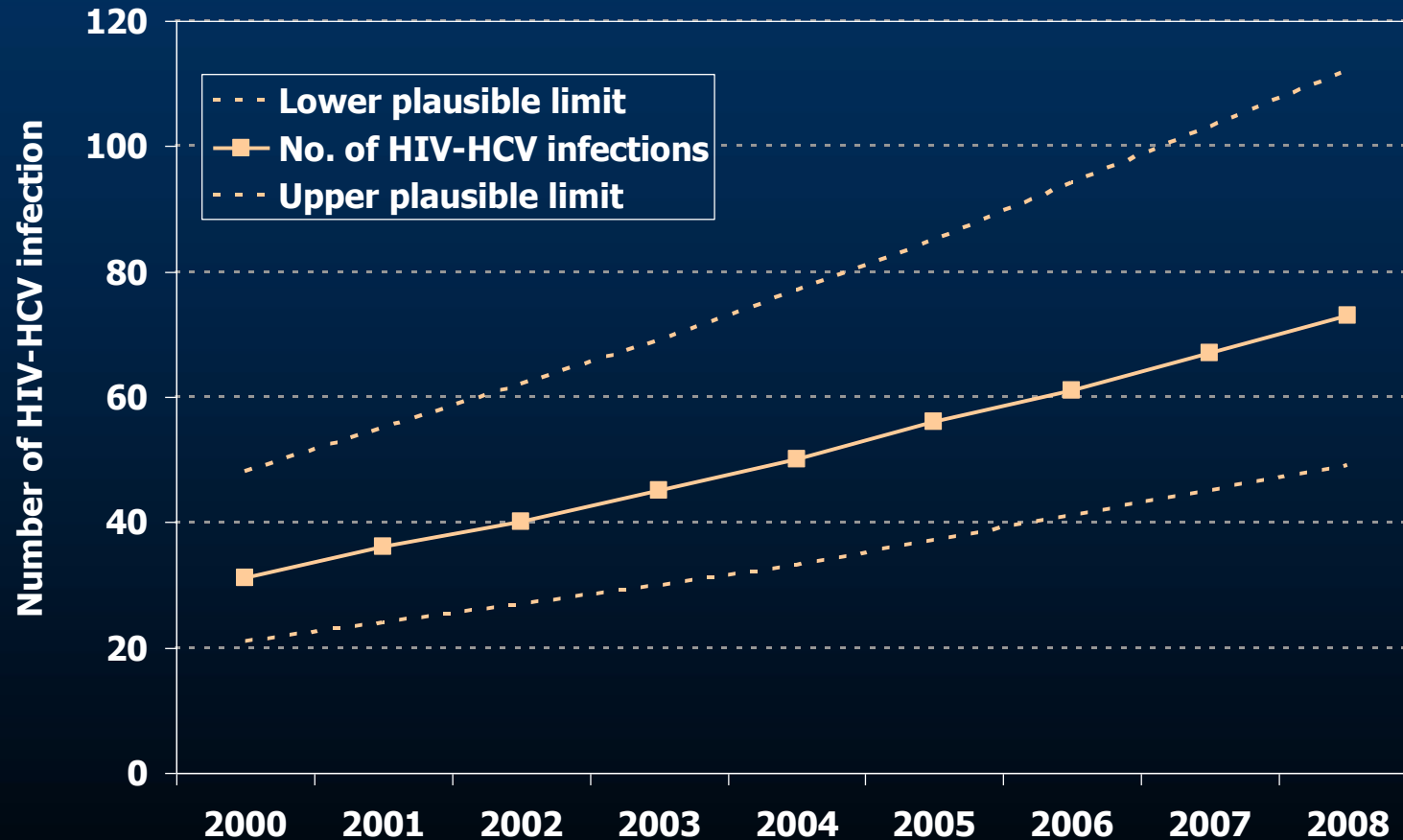
Modeled HIV-HCV coinfection MSM-IDU, Ontario, 2000-2008



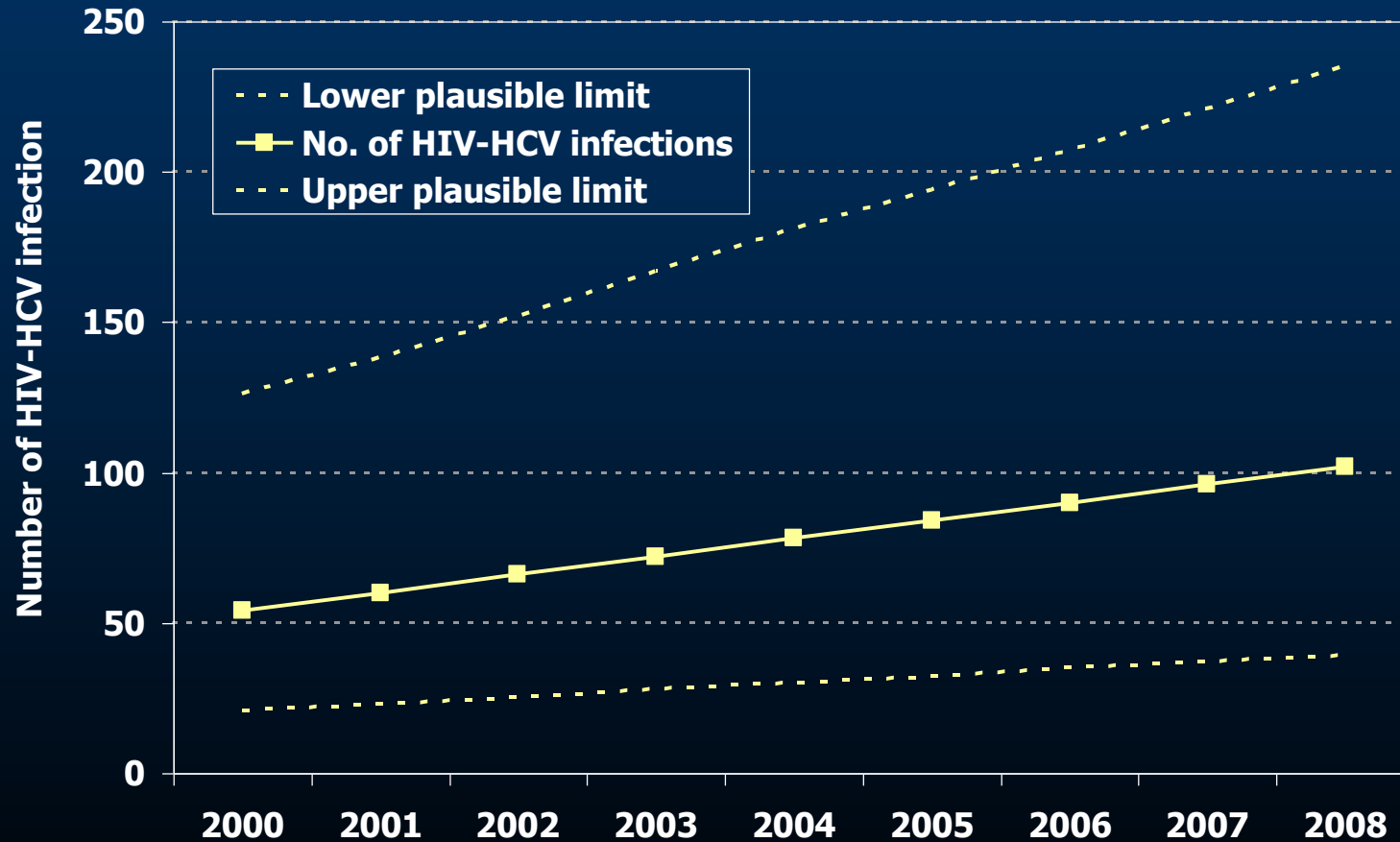
Modeled HIV-HCV coinfection IDU, Ontario, 2000-2008



Modeled HIV-HCV coinfection HIV-endemic, Ontario, 2000-2008



Modeled HIV-HCV coinfection Heterosexual, Ontario, 2000-2008





HIV-HBV coinfection

Modeled HIV-HBV coinfection by exposure category, Canada, 2008



	Number HIV-infected	Proportion HBV	Number HBV-infected	Proportion in Canada
MSM	31,330	12.0%	3,760	58.7%
MSM-IDU	2,030	8.0%	162	2.5%
IDU	11,180	8.0%	894	14.0%
HIV-endemic	9,250	11.0%	1,018	15.9%
Heterosexual	10,710	5.0%	536	8.4%
Other	500	6.0%	30	0.47%
Total	65,000	9.8%	6,399	100%

Modeled HIV-HBV coinfection by exposure category, Ontario, 2008



	Number HIV-infected	Proportion HBV	Number HBV-infected	Proportion in Ontario
MSM	15,073	12.0%	1,809	65.6%
MSM-IDU	617	8.0%	49	1.8%
IDU	1,988	8.0%	159	5.8%
HIV-endemic	4,878	11.0%	537	19.4%
Heterosexual	3,920	5.0%	196	7.1%
Other	151	6.0%	9	0.33%
Total	26,627	10.4%	2,759	100%

Modeled HIV-HBV coinfection by health region, Ontario, 2008



	Number HIV-infection	Proportion HBV	Number HBV-infected	Proportion in Ontario
Toronto	16,665	10.7%	1,787	64.8%
Ottawa	3,170	9.9%	314	11.4%
Central East, other	1,835	9.7%	179	6.5%
Eastern, other	660	9.5%	63	2.3%
Central West	1,995	10.0%	199	7.2%
Southwest	1,645	9.9%	163	5.9%
Northern	665	8.3%	55	2.0%
Total	26,630	10.4%	2,760	100%

Modeled HIV-HBV coinfection by exposure category, Toronto, 2008



	Number HIV-infected	Proportion HBV	Number HBV-infected	Proportion in Toronto
MSM	10,730	12.0%	1,288	72.0%
MSM-IDU	325	8.0%	26	1.5%
IDU	685	8.0%	55	3.1%
HIV-endemic	2,860	11.0%	315	17.6%
Heterosexual	1,970	5.0%	99	5.5%
Other	95	6.0%	6	0.32%
Total	16,665	10.7%	1,787	100%

Number of HIV-HBV coinfections by exposure category, Canada, 2002, 2005 and 2008



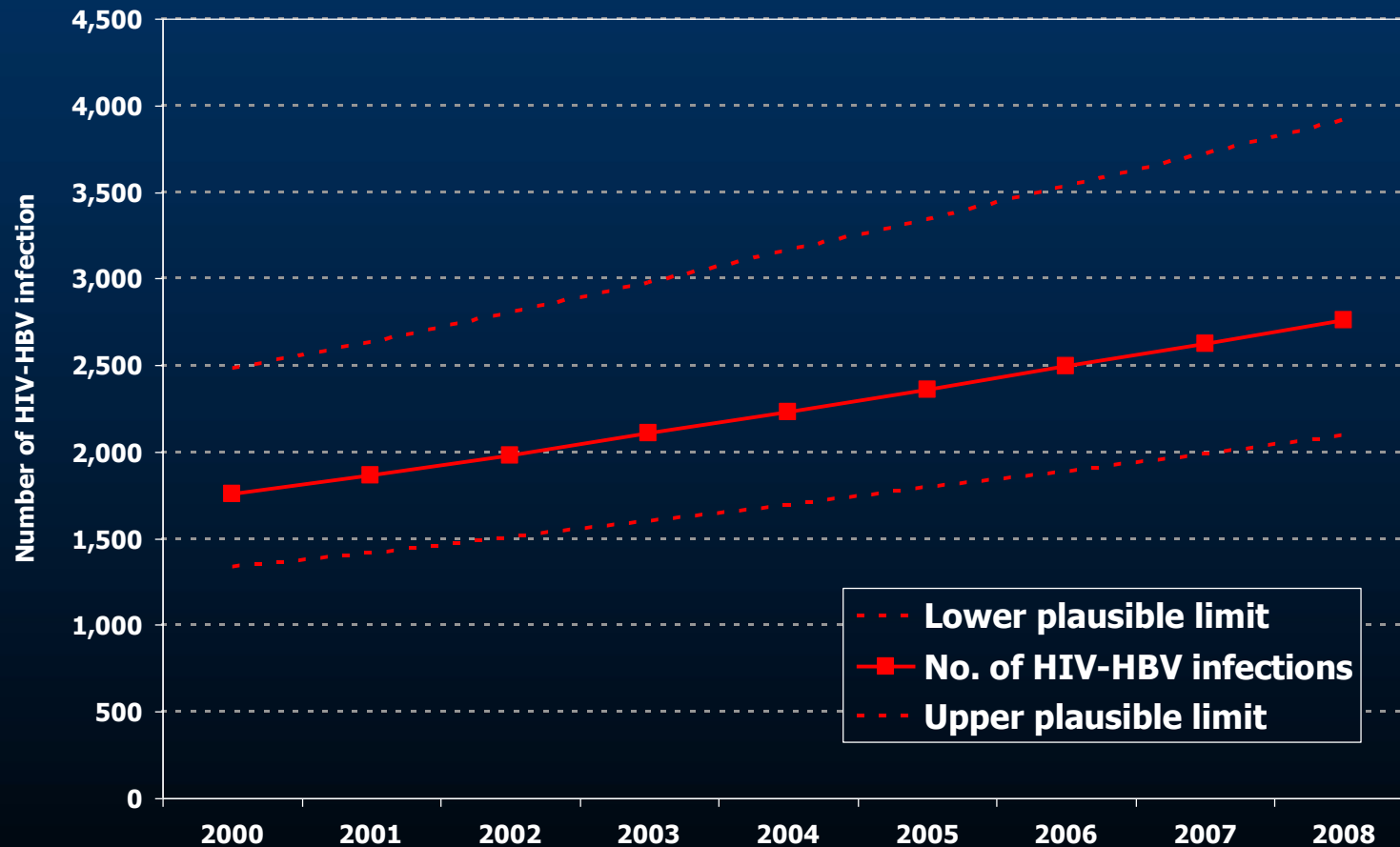
	2002	2005	2008
MSM	3,144	3,552	3,760
MSM-IDU	152	180	162
IDU	712	789	894
HIV-endemic	625	776	1,018
Heterosexual	348	431	536
Other	21	24	30
Total	5,001	5,751	6,399

Number of HIV-HBV coinfections by exposure category, Ontario, 2002, 2005 and 2008

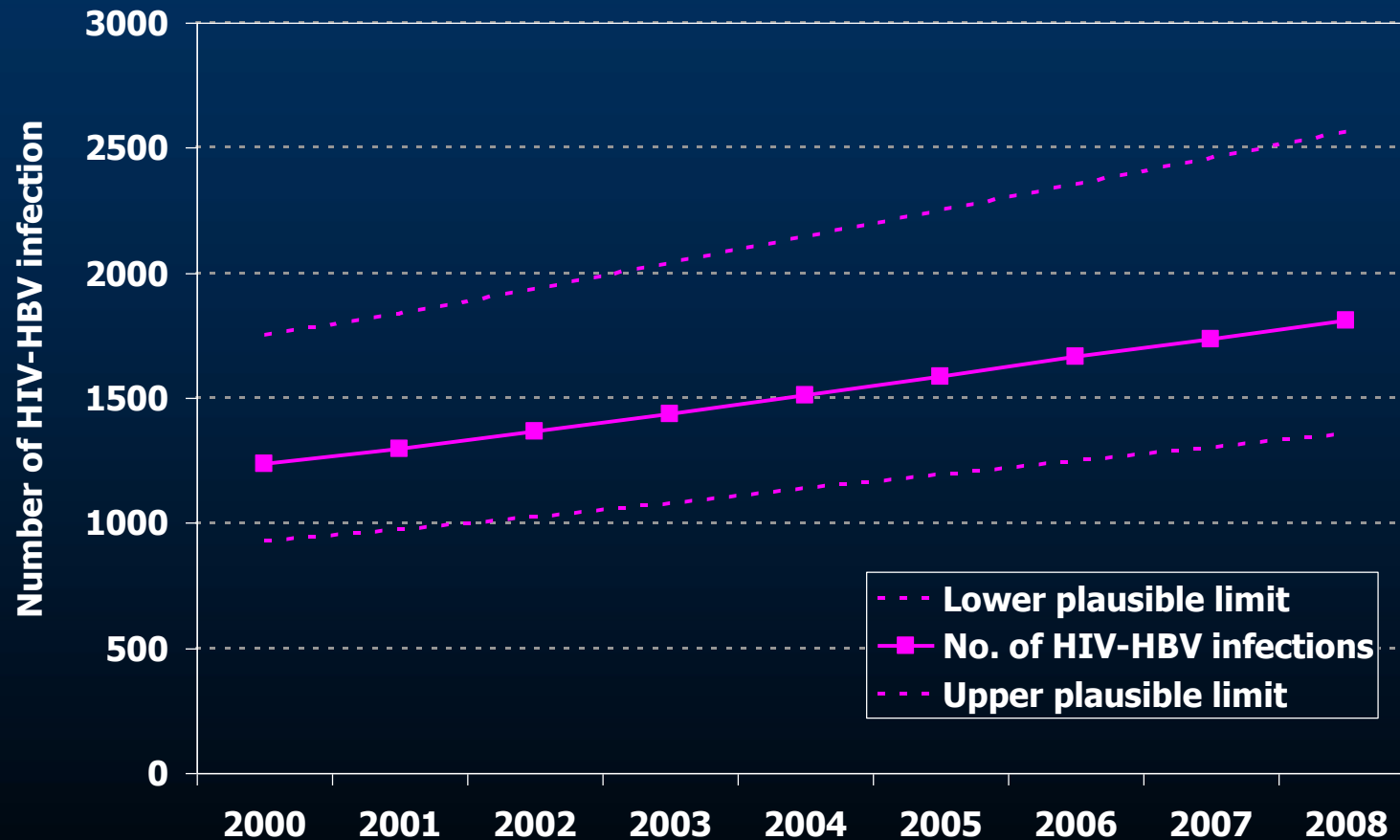


	2002	2005	2008
MSM	1,365	1,587	1,809
MSM-IDU	40	45	49
IDU	142	150	159
HIV-endemic	296	407	537
Heterosexual	127	162	196
Other	11	10	9
Total	1,980	2,360	2,759

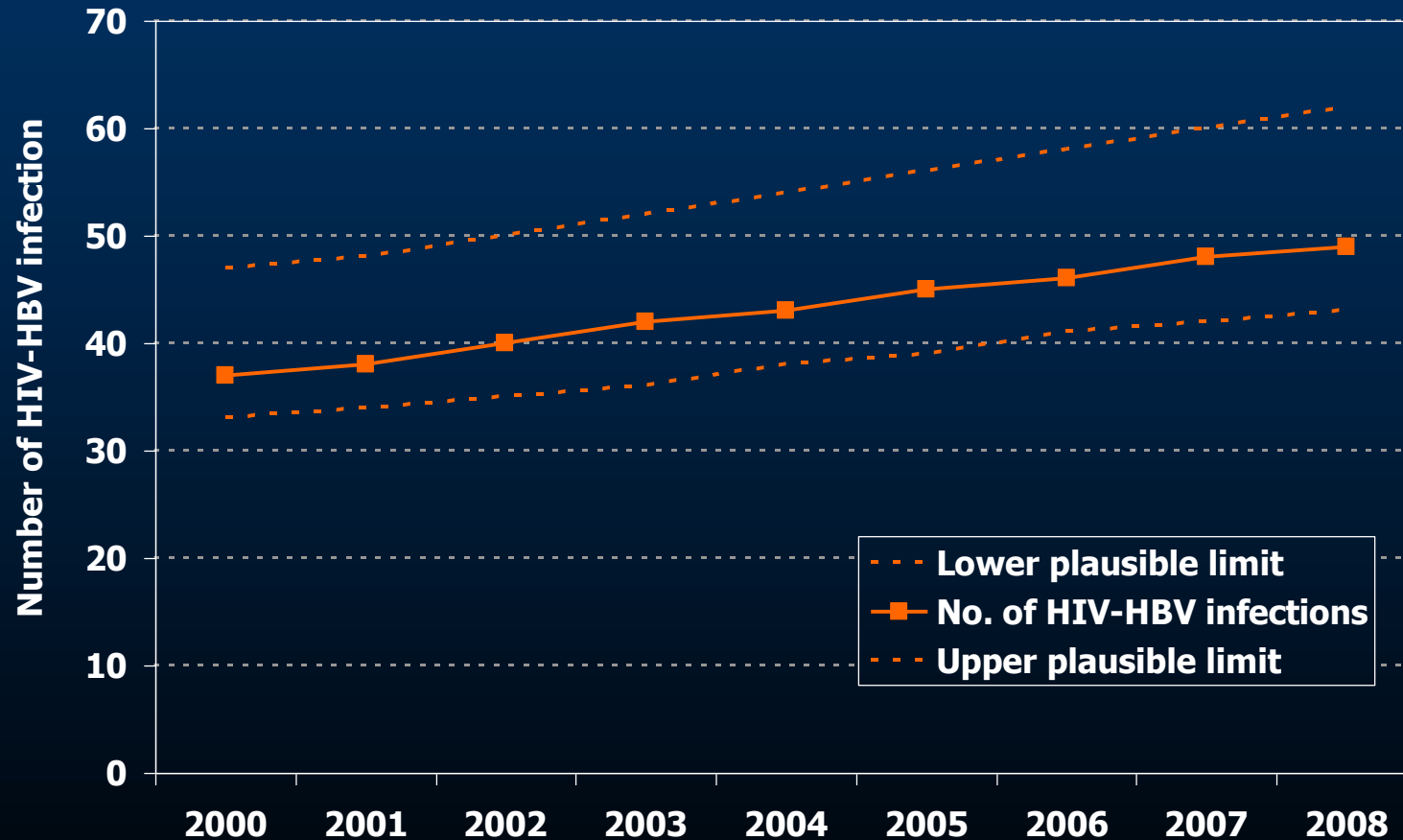
Modeled HIV-HBV coinfection Ontario, 2000-2008



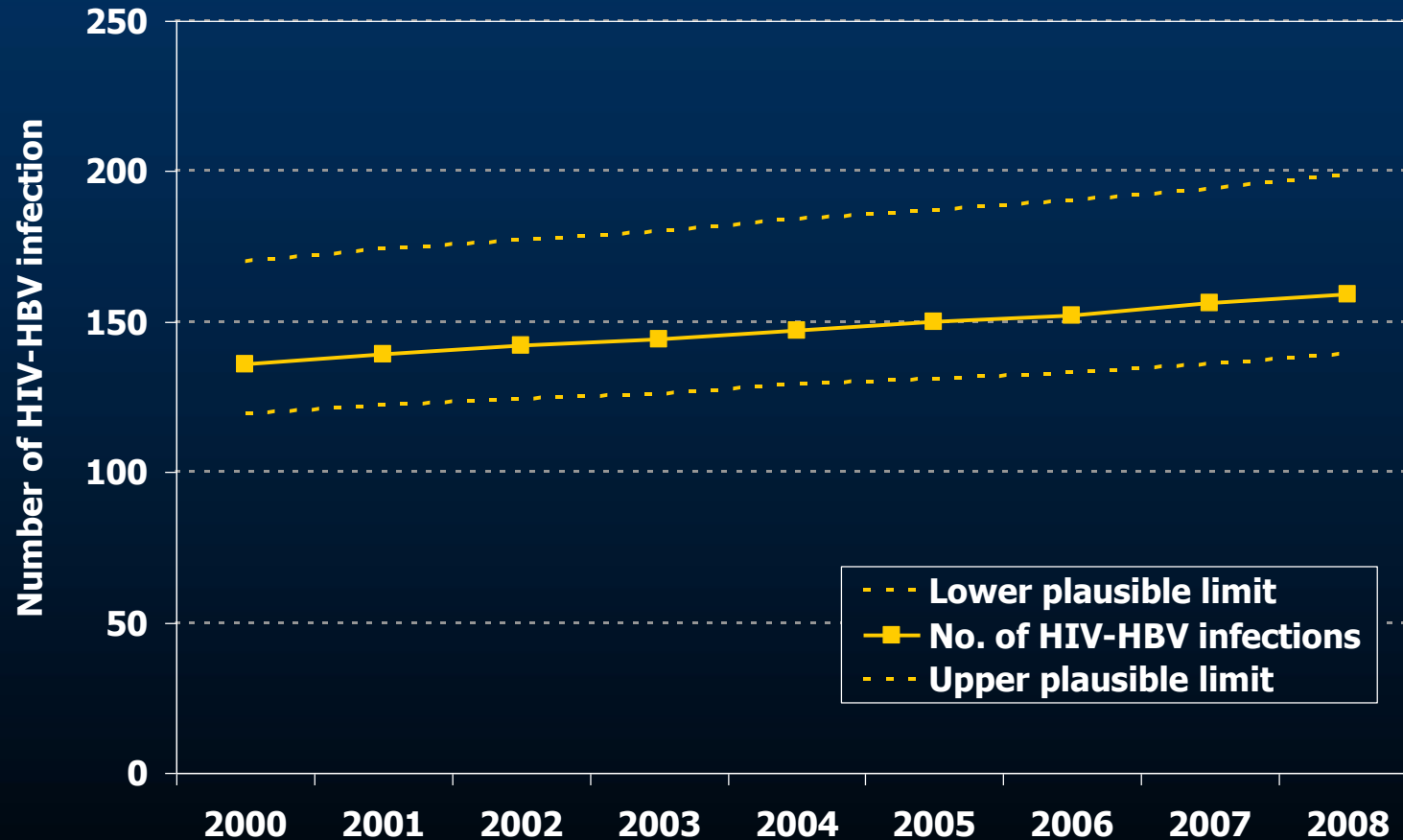
Modeled HIV-HBV coinfection MSM, Ontario, 2000-2008



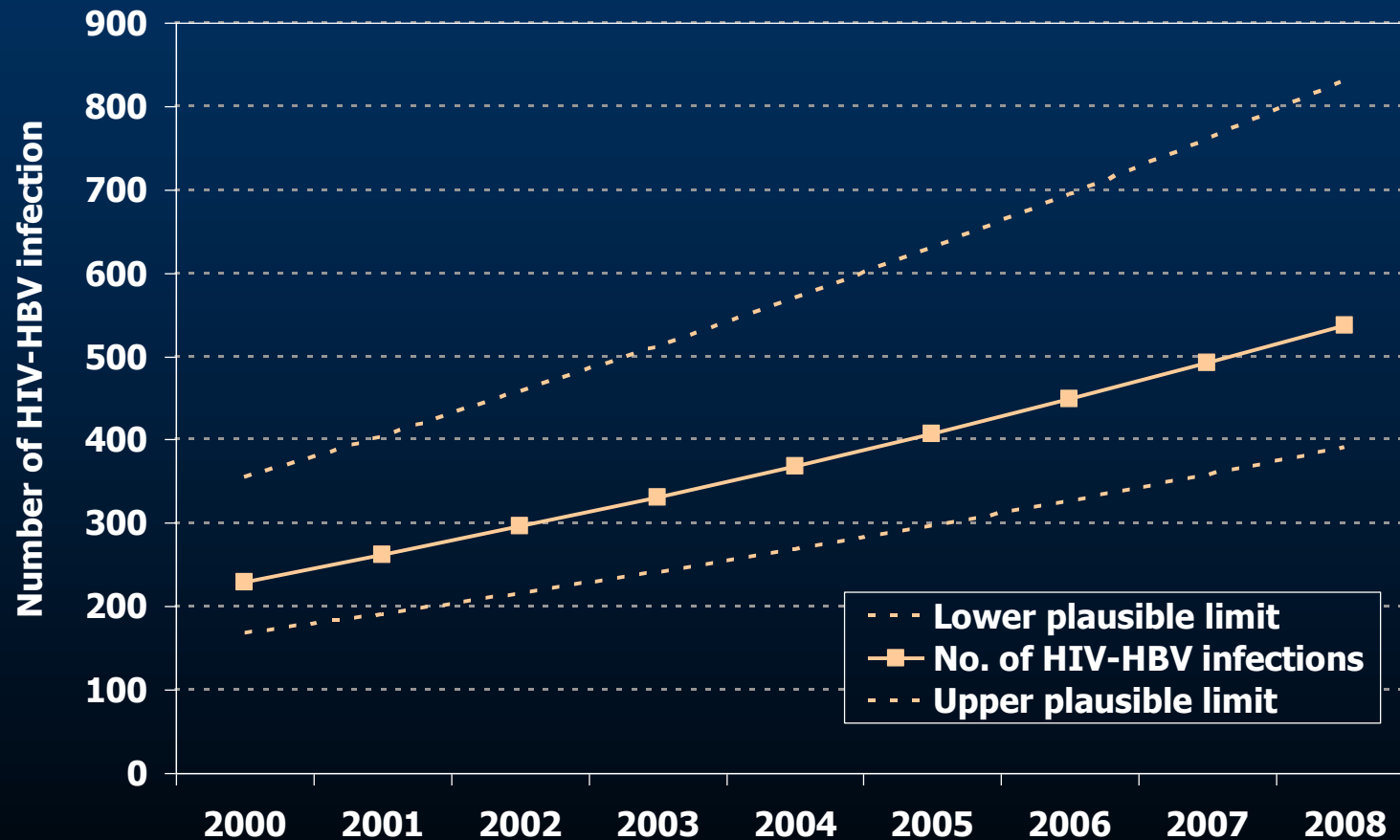
Modeled HIV-HBV coinfection MSM-IDU, Ontario, 2000-2008



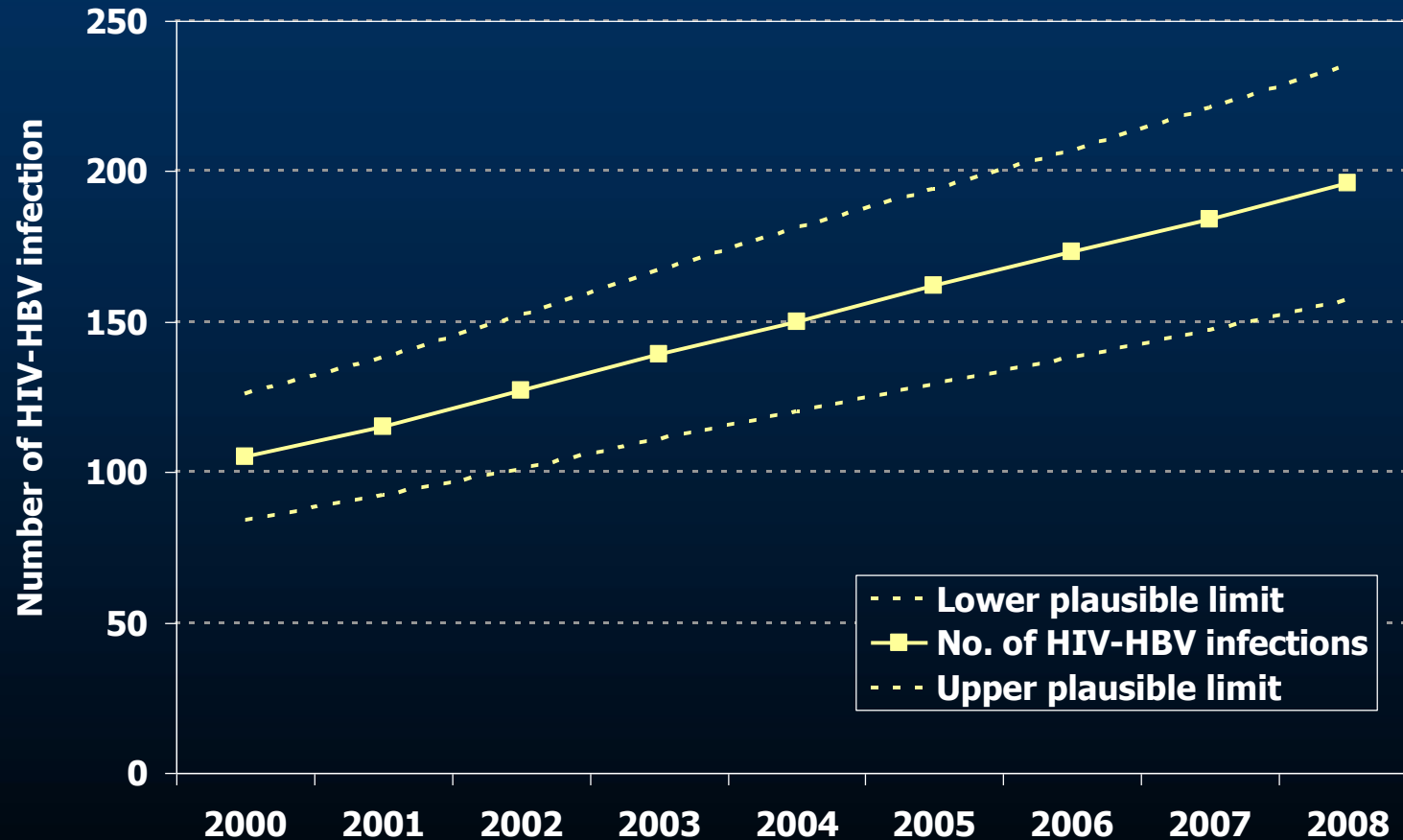
Modeled HIV-HBV coinfection IDU, Ontario, 2000-2008



Modeled HIV-HBV coinfection HIV-endemic, Ontario, 2000-2008



Modeled HIV-HBV coinfection Heterosexual, Ontario, 2000-2008





Summary (1)

As of 2008:

- Of 65,000 HIV-infected persons in Canada
 - 20.2% (13,130) infected with HCV
 - 9.8% (6,400) infected with HBV
- Of 26,600 HIV-infected persons in Ontario
 - 11.6% (3,100) infected with HCV
 - 10.4% (2,760) infected with HBV
- Of 16,700 HIV-infected persons in Toronto
 - 8.8% (1,470) infected with HCV
 - 10.7% (1,790) infected with HBV

Summary (2)



Regarding to exposure category for HIV:

- In Canada, 71% of HIV-HCV coinfections were in IDU, followed by MSM-IDU 13% and MSM 10%
- In Ontario, 53% of HIV-HCV coinfections were in IDU, followed by MSM 20% and MSM-IDU 16%
- In Toronto, 39% of HIV-HCV coinfections were in IDU, followed by MSM 31% and MSM-IDU 18%

Summary (3)



Regarding to exposure category for HIV

- In Canada, 66% of HIV-HBV coinfections were in MSM, followed by HIV-endemic 16%, IDU 14% and heterosexual 8%
- In Ontario, 66% of HIV-HBV coinfections were in MSM, followed by HIV-endemic 19% and heterosexual 7%
- In Toronto, 72% of HIV-HBV coinfections were in MSM, followed by HIV-endemic 18% and heterosexual 6%



Limitations

- Current estimated number of HIV-HCV and HIV-HBV coinfection are hypotheses, not conclusions
 - Estimates of HCV, HBV prevalence among HIV-infected persons identified through the literature review
 - Lack of studies on HBV infection among HIV-infected persons in Canada
- Epidemiology of HIV-HCV and HIV-HBV coinfection in Ontario remains poorly defined

Acknowledgements



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