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# Increase Your Marketing Efficiency by Building Your Modeling Assets:

## A Case Study from Heart & Stroke Lottery

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# About the Heart and Stroke Foundation

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## Mission

- **The Heart and Stroke Foundation of Ontario (HSFO) is a community-based volunteer organization whose mission is to reduce the risk of premature death and disability from heart disease and stroke by raising funds for research and health promotion**



# Why A Lottery Program?

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- Charity Lottery category is an excellent fundraising vehicle
- Lotteries help raise “new monies” without impinging on existing fund raising programs
- Since inception, the Heart & Stroke Lottery has generated over \$100 million (net)
- This has enabled HSFO to support unique research initiatives and health education programs



# Heart & Stroke Lottery – Then and Now

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- The first lottery was conducted in the Winter of 1997
  - 185,000 tickets were purchased
  - Since that time.....



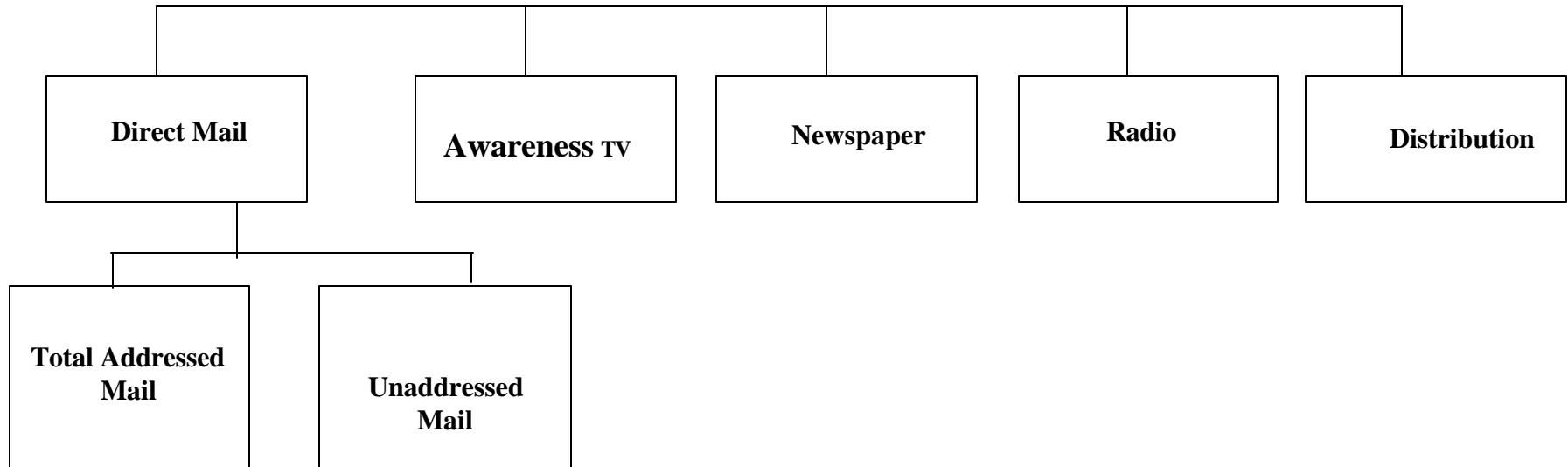
# Heart & Stroke Lottery – Then and Now

	Then	Now
Tickets Per Year	185,000	450,000+
Marketing Cost/Year	X	2.7X
Cost Per Ticket	X	1.3X
Profit	X	3X

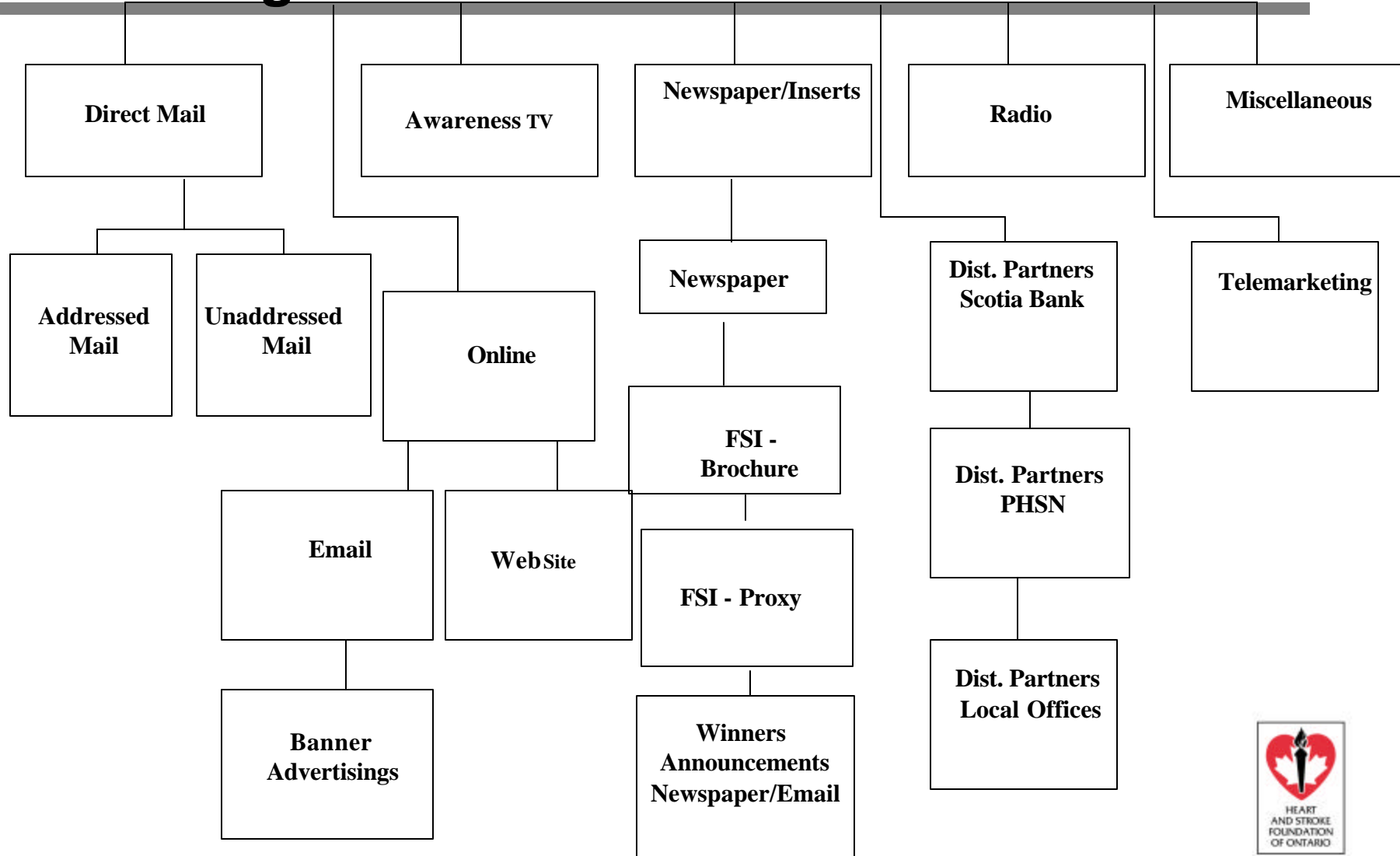
- The Heart & Stroke Lottery has been able to sustain tremendous sales growth, while keeping its costs in check
- Thus, improving its contributions to the *mission*



# Heart & Stroke Lottery Marketing Matrix - Then



# Heart & Stroke Lottery Marketing Matrix - Now



# Using Data Mining and Models

- To maximize contributions to the *mission*, the Heart & Stroke Lottery team recognized that it needed to:
  - take advantage of marketing intelligence techniques
    - Modeling and other targeting tools
    - Ongoing measurement and testing
    - Consumer Research
  - maintain and benefit from a past supporters database





# Using Data Mining and Models

- As the Lottery market place grew and became more complex, many questions needed to be answered in order to ensure net revenue growth for the *mission*
- Which past supporters are most likely to repeat?
  - Which supporters will buy early in the campaign?
  - What areas are best to target for acquisition?
  - What other HSFO supporters are most likely to buy a Lottery ticket?
  - Which past supporters are most likely to respond to Telemarketing?
    - Response?
    - Contact/Dial?

# Data Mining and Models – Answering the Questions



- Since November 1999 the Heart & Stroke Lottery has been using data mining and models to improve its contributions to heart and stroke research and health promotion programs
- The first predictive model was developed to identify past supporters with the highest propensity to repurchase



# Data Mining and Models – Answering the Questions

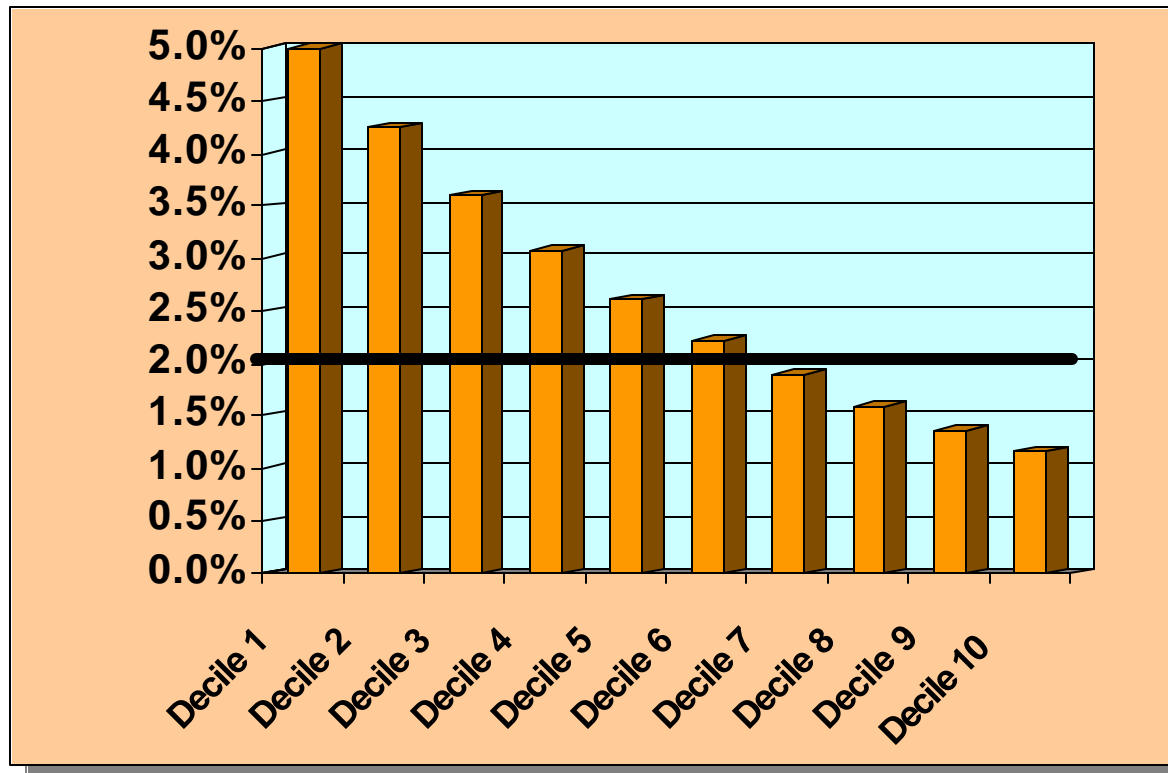


- Since that time a number of other tools have been developed, including:
  - **Addressed Mail Predictive Model** to identify which segments will be most responsive and early responders
  - **Unaddressed Acquisition Model** to identify best postal walks to target from an acquisition stand point
  - **In House Predictive Acquisition Model** to identify potential acquisition from in-house donor database
  - **Telemarketing Predictive Response Model** to identify past supporters most likely to buy through telemarketing
  - **Telemarketing Optimization Model (Dial Model)** to identify best past supporters who require the least amount of effort (for cost efficiencies) to contact



# Why Data Mining and Models

- Data Mining is about identifying opportunities to improve business results
- This may be achieved by identifying segments of customers that outperform others based on certain business objectives (an objective function)
- For example, the results from the predictive model below identifies customers more or less likely to respond to a particular Direct Mail offer



# Objective of Model – Addressed Mail Model

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- Produce a list of variables (model equation) that will predict previous supporters likelihood to respond to a future campaign
- Apply the model to past supporters on the database and produce a ranking of individuals likelihood to respond to a future campaign

# Addressed Mail Predictive Model

Model Objective:

- To Predict the likelihood of recommitment from a previous supporters
- To select the top customers to target for addressed mailings

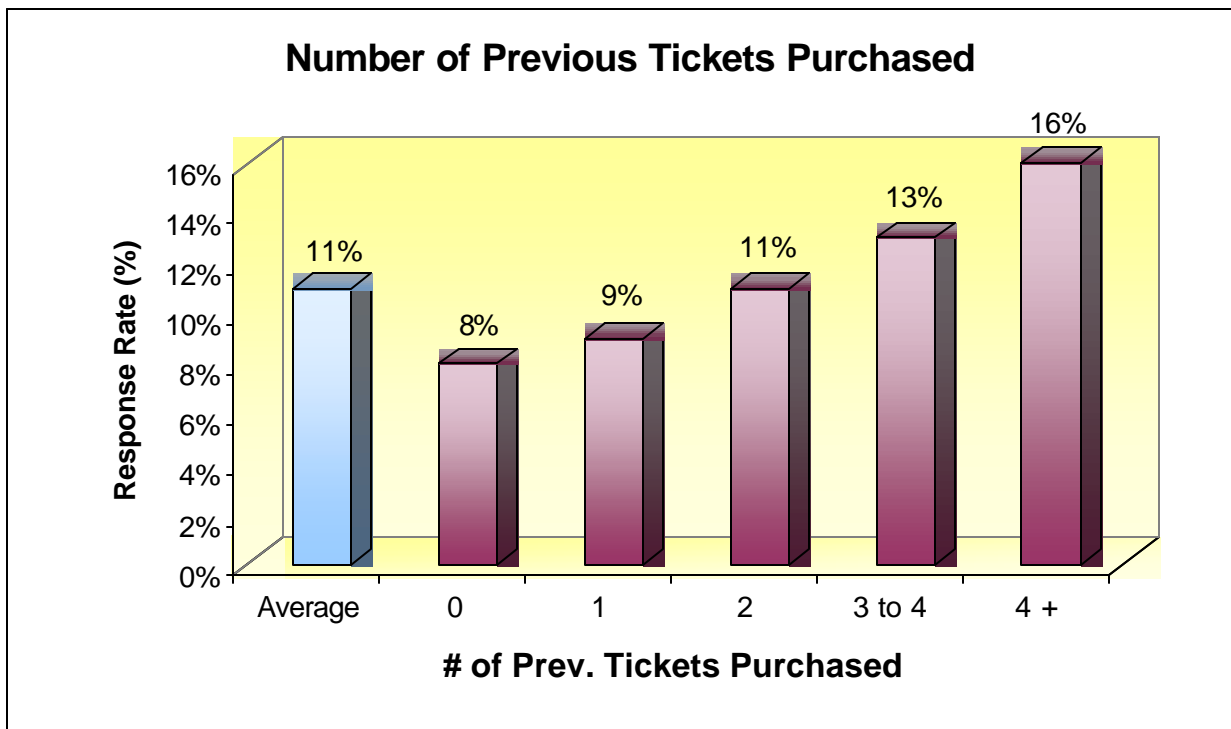
Key predictors:

Variable	Impact
Number of Previous Tickets Purchased	+
Recency of Last Ticket Purchase	-
Past Winner	+
Movers	-
Payment Method is Cash	-
Contacted Code Equal to Television	-
Lives in Urban Area (vs. Rural)	+
Lives in Toronto	+
Male	+



# Number of Previous Tickets Purchased

Description	Range of Variable	Response Rate
Number of Previous Tickets Purchased	Average	11%
	0	8%
	1	9%
	2	11%
	3 to 4	13%
	4 +	16%

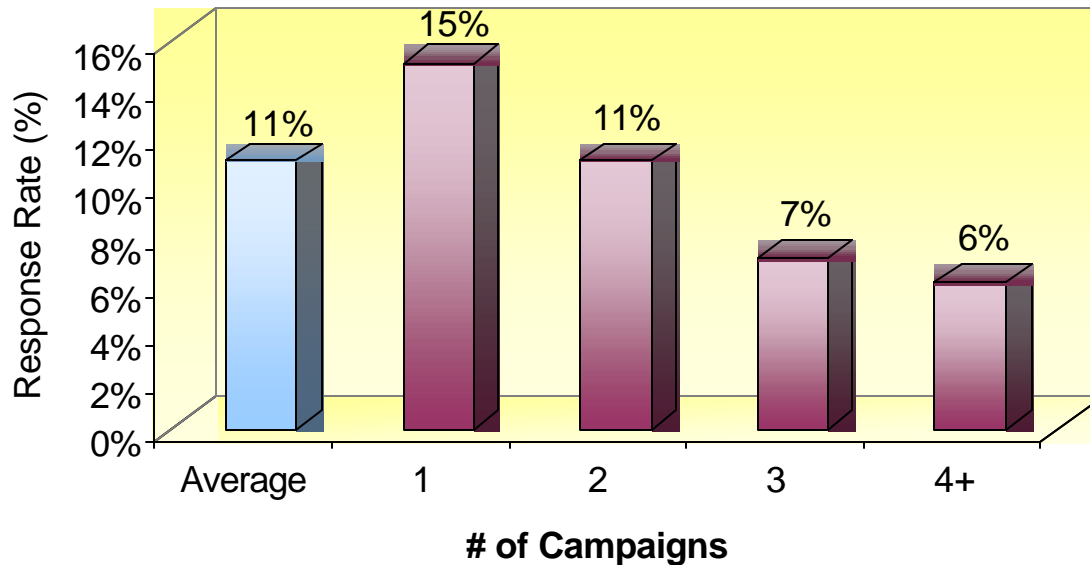


The higher the number of previous purchases, the higher the response

# Recency of Last Purchase (# of Campaigns)

Description	Range of Variable	Response Rate
Recency of Last Ticket Purchase (# of Campaigns)	Average	11%
	1	15%
	2	11%
	3	7%
	4+	6%

Recency of Last Ticket Purchase



Those more recent are more likely to purchase





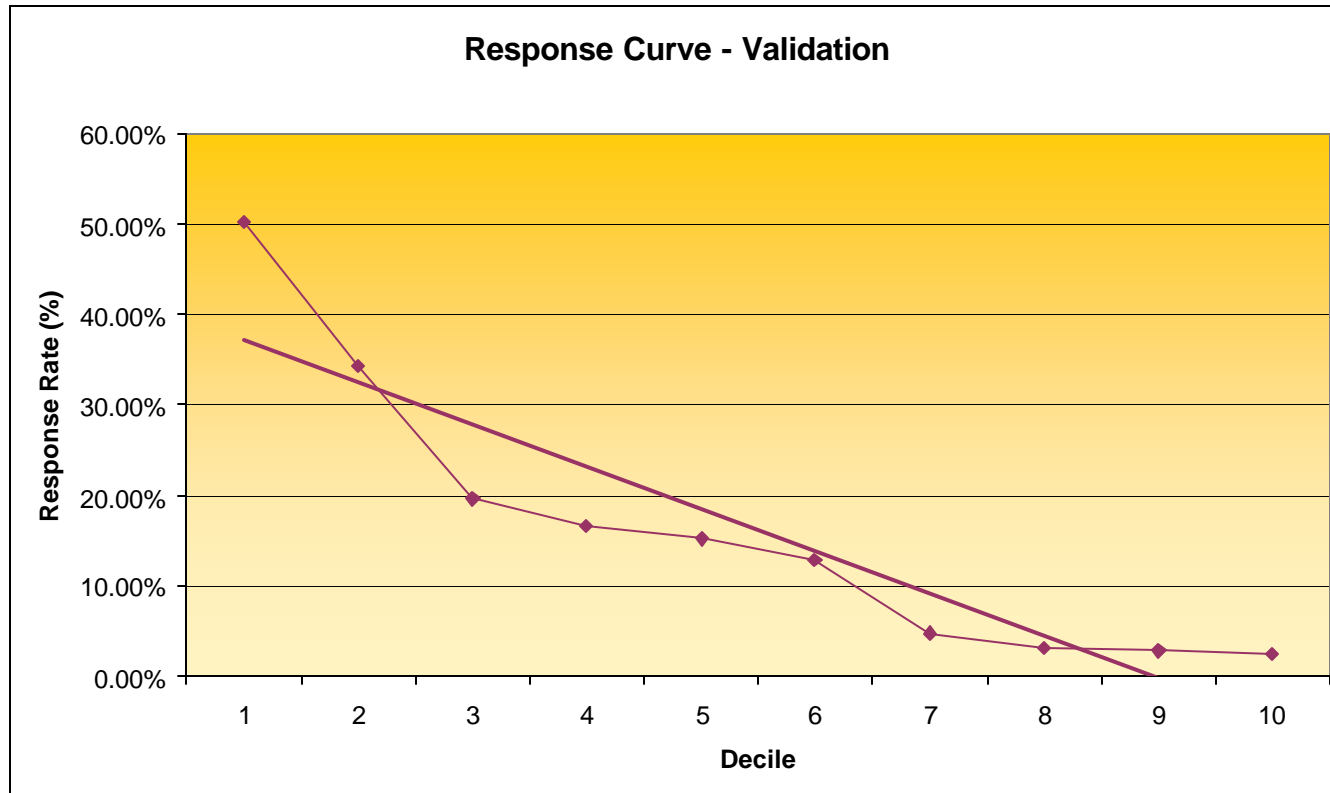
# How Do The Tools Perform?

*\*Results presented have been indexed;  
however the model ranks, relative  
response rates, relative costs and  
historical trends are accurate.*



# Validation - Addressed Mail Model

## All Repeat Ticket Sales By Decile – Response Curve



- The results show how well the Addressed Mail Predictive Model does in terms of predicting future supporters



# Validation - Addressed Mail Model

## All Repeat Ticket Sales By Decile – Gains Chart

Model Rank/Decile	Avg. Resp. Rate in Interval	Cumulative Resp. Rate	Cumulative % of Responders in Interval	Cumulative Lift in Resp. Rate
1	<b>50%</b>	50%	31%	310%
2	34%	42%	52%	261%
3	20%	35%	64%	214%
4	17%	30%	74%	186%
5	15%	27%	<b>84%</b>	168%
6	13%	25%	92%	153%
7	5%	22%	95%	135%
8	3%	20%	97%	121%
9	3%	18%	98%	109%
10	<b>3%</b>	16%	100%	100%
<b>Total</b>	<b>16%</b>			

- Validation results to a recent campaign for all past Lottery supporters
  - In total 16% repurchased a ticket
    - 50% of those from the top model rank (top 10%)
    - 3% of those from the bottom model rank (bottom 10%)
- 84% of all repurchaser come from the top 5 deciles of past supporters
  - That means 84% of the sales can be achieved at 50% of the cost – maximizing contributions to the *mission*



# Dollar Benefits of Modeling - Example

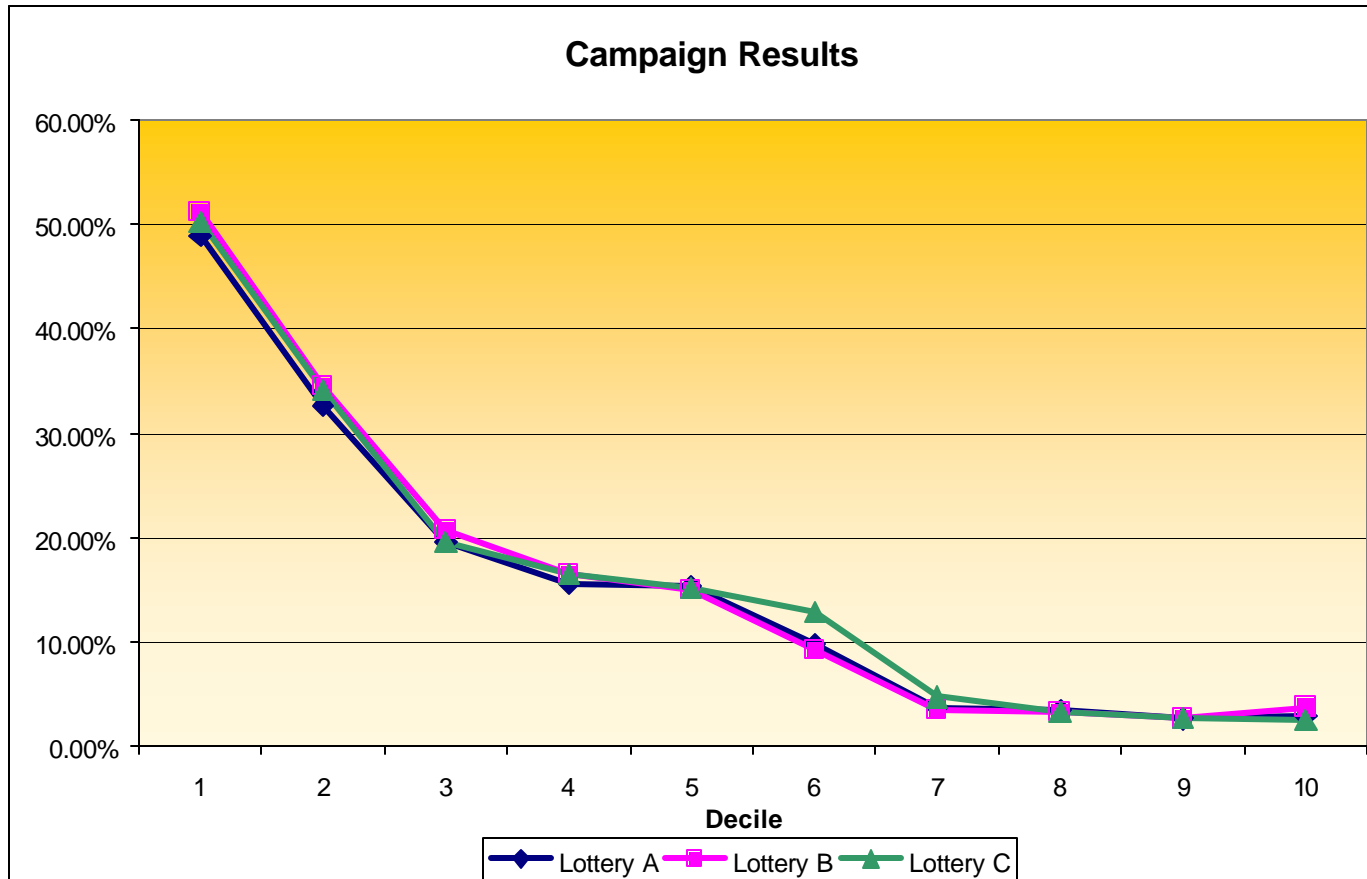
- Another way to look at the benefit of modeling is to determine the additional costs associated with achieving the same number of sales if a model were not used

<b>\$ Benefit of Modelling (based on a database of 100,000)</b>						
	<b># Mailed</b>	<b>Resp. Rate</b>	<b>Sales</b>	<b>Cost/ Comm.</b>	<b>Total Cost</b>	<b>Cost/ Sale</b>
Model (Top 50%)	50,000	27%	13,575	\$2	\$100,000	\$7.37
No Model	83,796	16%	13,575	\$2	\$167,593	\$12.35
<b>Difference</b>	<b>33,796</b>				<b>\$67,593</b>	<b>\$4.98</b>

- In order to acquire 13,575 sales with a random (no modeled) list, an additional 33,796 pieces of mail would be required at an additional cost of \$67,593 (or \$4.98/ticket)
- Based on this scenario an additional \$67,593 can be put toward vital research or other initiative that support the HSFO *mission*



# Historical Results – Past Supporters



- Result have remained very consistent over many campaigns



# Addressed Mail Model Results

## Sales by Source – Repeat Supporters

Model Rank/Decile	Total Resp. Rate	DM Resp. Rate	TM Resp. Rate	Un-addressed Resp. Rate	Public Resp. Rate
1	50%	23%	9%	5.7%	12%
2	34%	13%	8%	3.9%	9%
3	20%	7%	5%	2.1%	6%
4	17%	6%	3%	1.9%	5%
5	15%	6%	2%	1.6%	5%
6	13%	6%	1%	1.4%	3%
7	5%	2%	0%	0.50%	1.4%
8	3%	1%	0%	0.47%	1.3%
9	3%	1%	0%	0.42%	1.0%
10	3%	1%	0%	0.37%	0.7%
<b>Total</b>	<b>16%</b>	<b>7%</b>	<b>3%</b>	<b>2%</b>	<b>4%</b>

Not targeted

- This model provides benefits to Heart & Stroke Lottery for all sales channels



# Timing of Purchase

Model Rank	Period 1	Period 2	Period 3
1-3	45%	40%	15%
4-7	35%	33%	32%
8-10	26%	32%	42%
Total	36%	34%	30%
New Purchasers	12%	36%	52%

- Those with higher model ranks are more likely to purchase earlier in the campaign
- Benefits to HSFO:
  - Early sales result in marketing cuts during public campaign and more funds for *mission* spending

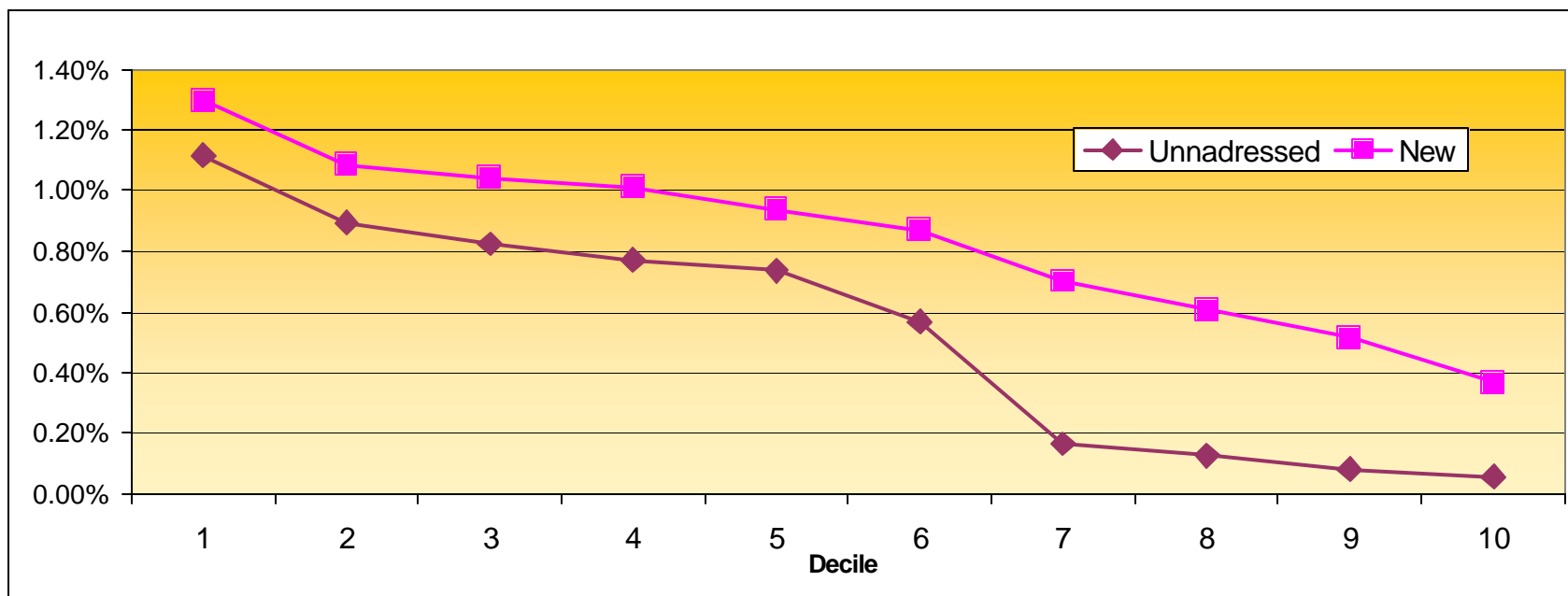


# Unaddressed Mail Acquisition Model

- Postal Walks are selected based on a combined ranking index that was developed based on the following:
  - a walks' past purchase history (or penetration rate)
  - a walks' previous unaddressed campaign response rate
- Combined Index = (Postal walk penetration index x 75%) + (Postal walk response index x 25%)
- HSFO Benefit:
  - A tool that estimates the number of pieces to be mailed based on required sales from channel
  - More funds directed to *mission*



# Unaddressed Mail Model Results



- Unaddressed Response Benefits:
  - Top 10 % of walks 18x better than bottom 10% (1.12% vs. .06%)
- New Response Benefits:
  - Top 10 % of walks 3.5x better than bottom 10% (1.29% vs. .37%)



# Telemarketing Optimization Model

- Designed tool to help optimize calling efforts
  - Reduce cost to HSFO
- Key variables
  - Age
  - Loyalty
  - Type of Dwelling
  - Gender

# Telemarketing Optimization Model— Performance by Quartile

## Indexed Results

Rank Quintile	Gross Resp. Rate	Contact Rate	Net Resp. Rate	Cost/Responder
1	149%	123%	124%	57%
2	112%	101%	114%	76%
3	84%	88%	97%	93%
4	55%	87%	65%	174%
<b>Grand Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

- Results comparison by quartile (bottom quartile vs. top quartile):
  - Gross Response Rate – 2.7 times better
  - Contact Rate – 1.4 times better
  - Net Response Rate – 1.9 times better
  - Cost/Response - 3.1 time better



# Combining the Tools

- While these tools all work well individually for their designed purpose, there is tremendous benefits in combining these tools
- To illustrate, we have combined the following two tools:
  - the Addressed Mail Predictive Model, and
  - the Telemarketing Optimization Model



# Combining the Addressed Model with the TM Optimization Model

Costs/Resp Index	Telemarketing Optimization Model - Quintile				
Addressed Mail Rank - Decile	4	3	2	1	Total
1 to 3	\$2.44	\$1.52	\$1.01	<b>\$0.62</b>	<b>\$0.70</b>
4 to 7	\$2.23	\$1.54	\$1.38	\$0.96	<b>\$1.20</b>
8 to 10	<b>\$2.87</b>	\$1.55	\$1.47	\$1.31	<b>\$1.46</b>
Total	<b>\$2.49</b>	<b>\$1.54</b>	<b>\$1.29</b>	<b>\$0.76</b>	<b>\$1.00</b>

- Table shows the “indexed’ cost/response/segment when we combining the two tools (results indexed based on average cost of \$1 per response)
  - TMO Rank 1/AM Rank 1-3 produces the lowest cost per ticket at **\$0.62**
  - TMO Rank 4/AM Rank 8-10 produces the highest cost per ticket at **\$2.87**
- **Benefits to HSFO:**
  - A tool that allows them optimize channel spending, thus ensuring maximum net return for HSFO



# Combining the Addressed Mail Model with the TM Dial Model



Costs/Resp Index	Indexed Avg. Cost = \$1				
	Telemarketing Optimization Model - Quintile				
Addressed Mail Rank - Decile	4	3	2	1	Total
1 to 3	\$2.44	\$1.52	\$1.01	\$0.62	\$0.70
4 to 7	\$2.23	\$1.54	\$1.38	\$0.96	\$1.20
8 to 10	\$2.87	\$1.55	\$1.47	\$1.31	\$1.46
Total	\$2.49	\$1.54	\$1.29	\$0.76	\$1.00

- Key benefit of combined tool is prioritizing channel
  - TMO Rank 1, AM Rank 4-7 and 8-11 names are better targets for TM than,
  - TMO Rank 2-4, AM Rank 1-3 names (which are better for DM)
- As Heart & Stroke Lottery's tools have evolved, knowledge on how to raise more funds for the *mission* has improved



# The Scoring Process

- Before each campaign any previous supporter is scored with two models:
  - The Addressed Predictive Model
  - The Telemarketing Optimization Model
- Also prior to each campaign Unaddressed Model is re-calculated based on previous buyer penetration rate and the last unaddressed campaign's response rate
- So each customer has 2 scores (and ranks) and each postal walk has a combined index score
- With these scores in place the the Lottery Team makes decision on:
  - Who receives Addressed Mail
  - Who gets Telemarketed
  - What walks are targeted for Unaddressed



# Teamwork

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- None of this will work without a strong team!!!
  - Heart & Stroke Lottery Team
  - JSI Data – Database and all the Data Processing/Analysis
  - Boire Filler Group – Model Development, Validation and Scoring
  - Miratel Solutions Inc. – Telemarketing
  - Ogilvyone Worldwide – Advertising Agency
  - IMI International – Market Research





# Things to Think About for Your Business

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- Identify your key business challenges (think of the key questions you would like answered)
- Can data mining tools assist you in answering these questions?
  - What is your data environment?
  - What type of improvements are you looking for?
  - How will the results be applied?
- Prioritize! Test! Learn! Improve!
- Involve your whole team
- Share and Integrate your learning



# Questions



# Thank You!

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