

Why Did the Pre-election Polls in South Korean Local Elections Go All Wrong? Assessing the Source of Errors using Dual-Frame Landline/Cell Phone Post-Election Survey

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Outline



Local Elections and Problems of Pre-Election Polls



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Local Elections and Problems of Pre-Election Polls

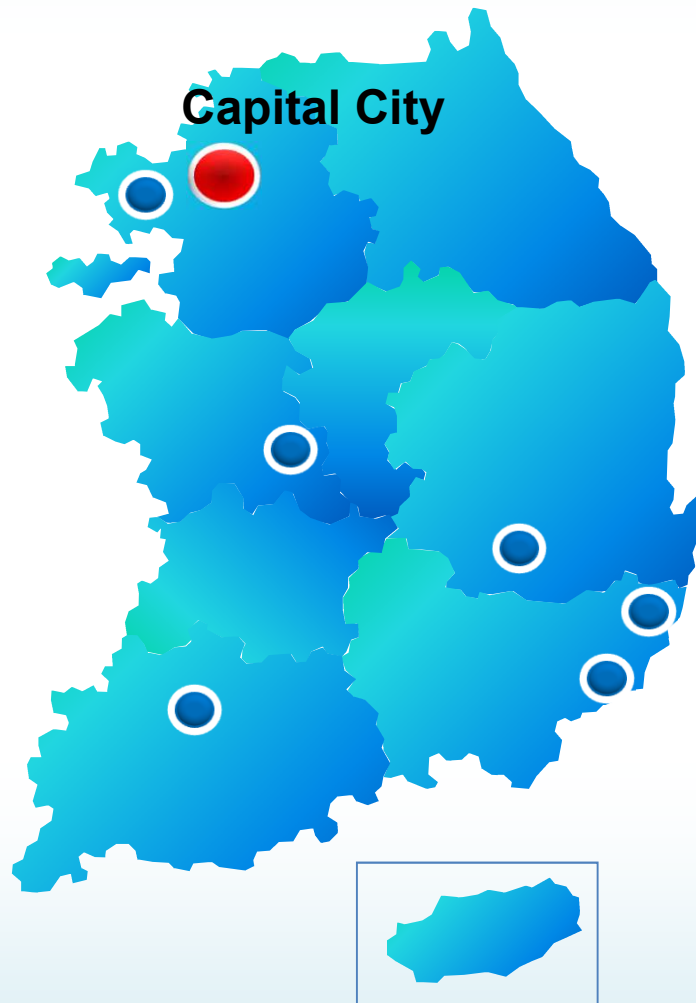
Korean Local Elections

(for 7 Mayors and 9 Provincial Governors)



- Election date: June 2, 2010
- Number of registered voters: 38,851,159
- Voter turnout: 54.5%
(highest for local elections)
- Publicizing the results of polls starting from a week before the elections is banned

Example: Seoul Mayoral Election



- Number of voters: 8,211,461
- Voter turnout: 53.9%

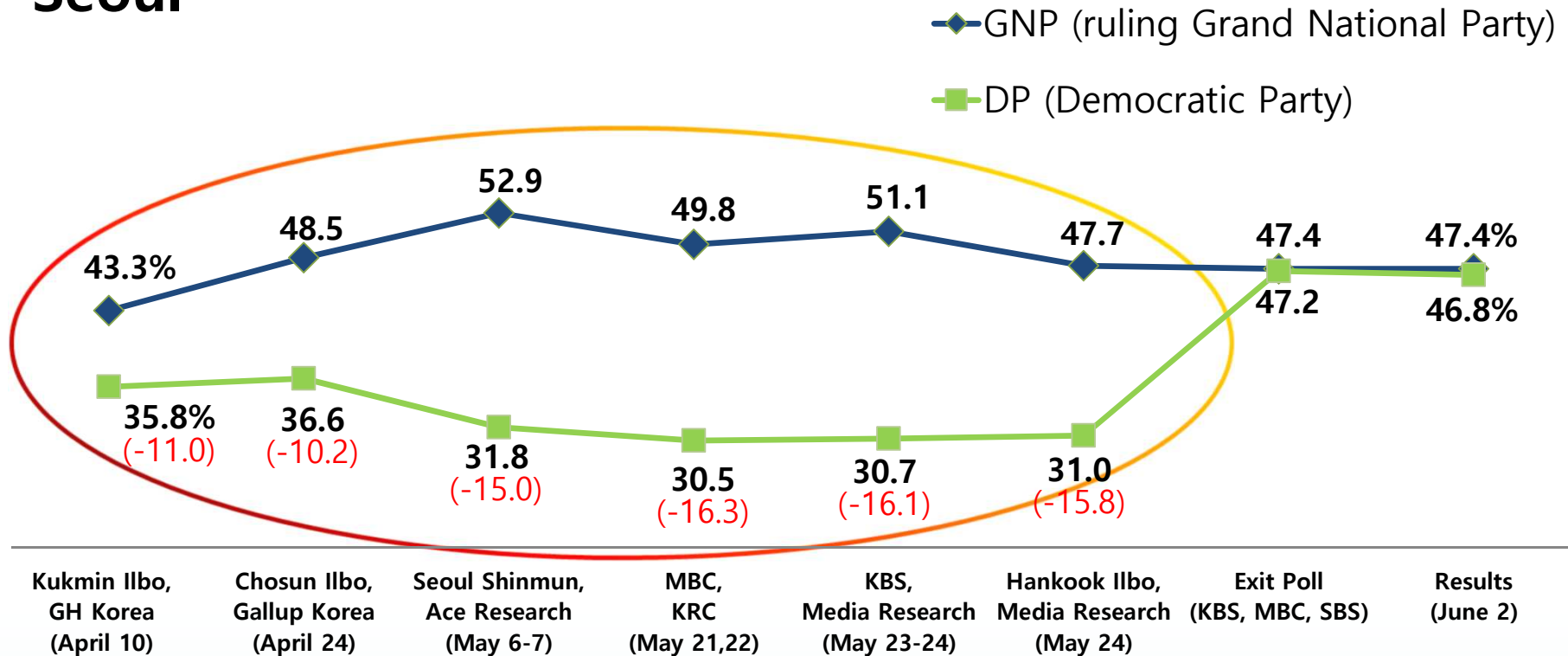
Example: Inchoen Mayoral Election



- Number of voters: 2,096,853
- Voter turnout: 50.9%

The Problems of Pre-Election Polls

Seoul



Source: JoongAng Daily (2011)

- **DP:** Highly underreported due to spiral of silence effect or some other sources of errors

The Problems of Pre-Election Polls (Cont.)

Poll estimates a week before elections

Area	Party of Candidate	Actual Result	5 Leading Media Groups (& Research Firms)				
			Poll A	Poll B	Poll C	Poll D	Poll E
Seoul	GNP	47.4%	48.9%	46.7%	50.8%	50.4%	51.6%
	Diff. (p.p.)		1.5	-0.7	3.4	2.6	4.2
	DP	46.8%	31.2%	30.5%	30.0%	32.6%	30.1%
	Diff. (p.p.)		-15.6	-16.3	-16.8	-14.2	-16.7
Incheon	GNP	44.4%	41.9%	42.6%	45.4%	44.2%	44.2%
	Diff. (p.p.)		-2.5	-1.8	1.0	-0.2	-0.2
	DP	52.7%	33.4%	34.4%	34.6%	32.9%	31.8%
	Diff. (p.p.)		-19.3	-18.3	-18.1	-19.8	-20.9

The Problems of Pre-Election Polls (Cont.)

Ranges of Diff. in 14 Other Areas

Areas [§]	Range of Diff. (Min, Max)		Areas [§]	Range of Diff. (Min, Max)	
	Winner	Second Finisher		Winner	Second Finisher
Pusan†	(-5.8, 0.6)	(-20.5, -16.9)	Gyongbuk‡	(-21.8, -8.4)	(-7.0, -5.2)
Taegu†	(-16.3, -8.3)	(-10.3, -4.8)	Chungnam‡	(-16.8, -12.7)	(-17.5, -14.7)
Daejon†	(-9.1, -6.6)	(-5.2, 2.6)	Jeollanam‡	(-7.4, -5.0)	(-7.6, -5.6)
Kwangju†	(-9.4, 3.0)	(-6.6, -5.2)	Jeollabuk‡	(-10.9, 1.4)	(-9.8, -4.7)
Ulsan†	(-8.0, -0.8)	(-14.3, -7.8)	Gangwon‡	(-26.7, -20.0)	(-1.6, 2.6)
Gyeonggi‡	(-7.5, -2.8)	(-18.1, -15.2)	Chungbuk‡	(-23.0, -13.8)	(-5.8, -1.0)
Gyeongnam‡	(-17.7, -12.0)	(-12.5, -4.5)	Jeju‡	(-8.9, -4.7)	(-20.8, -9.1)

§ Ordered by the number of voters at the metropolitan areas and provinces, respectively

† Metropolitan areas

‡ Provinces

Korean Election Poll Methodology

Design Element	Pre-Election Polls		Exit Polls
	Most polls	A few polls	
Listed Landline Frame	Yes		---
Landline RDD Frame		Yes	---
Cell Phone RDD Frame			---
Quota Sampling person level quota according to area, sex and age groups	Yes	Yes	---
Field Period (> 5 days)			---
Calls (> 5 per phone number)			---
Personal Face-to-Face Interviews			Yes
Weighting and Adjustment			Yes
Simple Analysis Methods	Yes	Yes	---
Sample Size per Poll (Area/National)	500~1,000 / 8,000~13,000		5,900~16,000 / 156,000

Sources of Errors by Types of Election Polls

➤ Pre-Election Polls

- Non-coverage (e.g., excluding unlisted phone numbers or cell only populations)
- Non-probability sampling (e.g., quota sampling)
- Non-response (e.g., not enough callbacks)
- Timing
- Question wording
- Response bias (social desirability, spiral of silence)
- Estimating turnout (estimating likelihood)

➤ Exit Polls

- Sampling
- Question wording
- Non-response
- Response bias (social desirability, spiral of silence)

Research Questions

- Did pre-election polls go all wrong, especially due to errors of non-observation such as non-coverage, sampling error and non-response?
- Considering cell phone coverage of 95%, can using cell phone numbers only be beneficial to pre-election polls?
- Due to the spiral of silence, is it truly hard to measure an opinion of voters precisely?
- What are the best ways to improve poll accuracy?

Post-Election Study

Key Elements

- In order to examine listed landline, landline RDD, cell RDD and dual RDD frames, we conducted a dual frame survey, which can be separated into surveys using each frame
- Because quota sampling used in pre-election polls is nonrandom, a point estimate can be biased and cannot be statistically evaluated. Thus, in this study the respondents are randomly selected.
- See demographic characteristics of random samples obtained without using quota sampling
- Use new weighting strategy

Survey Design

- Use of list-assisted RDD for a landline sample and RDD based on 10,000-banks for a cell sample
 - ➔ Reducing non-coverage
- Random selection of respondents using the same phone number, regardless of types of phones
 - ➔ Reducing sampling error
- Minimum of 10 calls per number during weekdays and weekends
 - ➔ Reducing non-response

Survey Design (Cont.)

- Sample size of 1,508 (landline 899 & cell 609) stratified by areas / politics
- 45-day field period starting 5 months after the elections
- Enhanced weighting system (Park *et al.*, JSM, 2011)

Survey Measurements

- Self-reported registration and voting
- Did you vote for the winner?
- Interest in politics
- Talk with anyone about the elections before voting
- Personal demographics (age, sex, education, etc.)
- Items related to sample weights

Sources of Errors in Post-Election Survey

- Timing
- Coverage
- Sampling
- Non-response
- Question wording
- Response bias (social desirability, spiral of silence)

Study Results

National Level

- **Whole Sample**
- **Sample of Actual Voters**
- **Sample of Voters Who Reported Voting for the Winner**

Whole Sample Demographic Characteristics by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD	2010 Census
Gender					
Male	40.7%	36.4%	55.8%	47.6%	48.9%
Female	59.3%	63.6%	44.2%	52.4%	51.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Age					
19-29	11.7%	12.2%	23.2%	20.1%	17.9%
30-39	9.5%	16.0%	24.7%	22.0%	21.2%
40-49	22.1%	28.3%	21.4%	23.5%	22.3%
50-59	20.5%	17.2%	15.4%	16.0%	17.9%
60 or over	36.2%	26.3%	15.3%	18.4%	20.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Demographic Characteristics of Sample of Voters by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD	Election* Study
Gender					
Male	41.1%	35.7%	56.8%	47.6%	49.5%
Female	58.9%	64.3%	43.2%	52.4%	50.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Age					
19-29	7.4%	8.0%	17.0%	14.1%	14.9%
30-39	6.4%	14.0%	20.6%	19.5%	17.7%
40-49	22.8%	28.8%	25.1%	25.9%	22.5%
50-59	23.9%	19.2%	16.6%	17.7%	20.2%
60 or over	39.4%	30.0%	20.7%	22.8%	24.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

*** Conducted by National Election Commission after the elections
with a very large sample size of 4,033,027 (10.4% of whole voters)**

Demographic Characteristics of Sample of Voters Voted for the Winner by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD
Gender				
Male	39.8%	32.8%	61.5%	48.6%
Female	60.2%	67.2%	38.5%	51.4%
Total	100.0%	100.0%	100.0%	100.0%
Age				
19-29	3.2%	4.7%	13.9%	11.7%
30-39	8.5%	16.6%	17.6%	18.3%
40-49	24.9%	28.1%	26.9%	26.7%
50-59	21.6%	19.0%	17.2%	17.8%
60 or over	42.0%	31.6%	24.3%	25.5%
Total	100.0%	100.0%	100.0%	100.0%

Whole Sample Characteristics for Relevant Attitudes by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD
Interest in Politics				
Very	5.1%	3.8%	5.3%	4.3%
Somewhat	11.7%	14.7%	15.9%	15.7%
Moderately	27.5%	32.6%	38.3%	35.3%
Not too	35.3%	32.8%	24.9%	28.4%
Not at all	20.3%	16.2%	15.7%	16.3%
Total	100.0%	100.0%	100.0%	100.0%
Talk with Anyone				
Yes	59.4%	59.6%	65.0%	61.0%
No	40.6%	40.4%	35.0%	39.0%
Total	100.0%	100.0%	100.0%	100.0%

Characteristics of Sample of Voters for Relevant Attitudes by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD
Interest in Politics				
Very	6.3%	5.1%	6.7%	5.4%
Somewhat	13.8%	17.4%	20.8%	20.3%
Moderately	28.9%	35.5%	35.5%	33.8%
Not too	34.5%	29.7%	24.3%	27.1%
Not at all	16.5%	12.3%	12.7%	13.4%
Total	100.0%	100.0%	100.0%	100.0%
Talk with Anyone				
Yes	59.4%	59.6%	65.0%	61.0%
No	40.6%	40.4%	35.0%	39.0%
Total	100.0%	100.0%	100.0%	100.0%

Characteristics of Sample of Voters Voted for the Winner by Relevant Attitudes by Sample Frame

	Listed Landline	Landline RDD	Cell RDD	Dual RDD
Interest in Politics				
Very	7.4%	5.6%	7.2%	5.5%
Somewhat	16.6%	17.7%	22.4%	21.7%
Moderately	27.7%	35.8%	36.3%	34.7%
Not too	31.3%	28.3%	22.5%	26.7%
Not at all	16.9%	12.6%	11.6%	11.4%
Total	100.0%	100.0%	100.0%	100.0%
Talk with Anyone				
Yes	60.3%	63.5%	67.5%	63.4%
No	39.7%	36.5%	32.5%	36.6%
Total	100.0%	100.0%	100.0%	100.0%

Geopolitical Level

Geopolitical Strata



➤ Based on the areas won for each party in the elections

➤ Strata:

GNP – 6 areas

DP – 7 areas

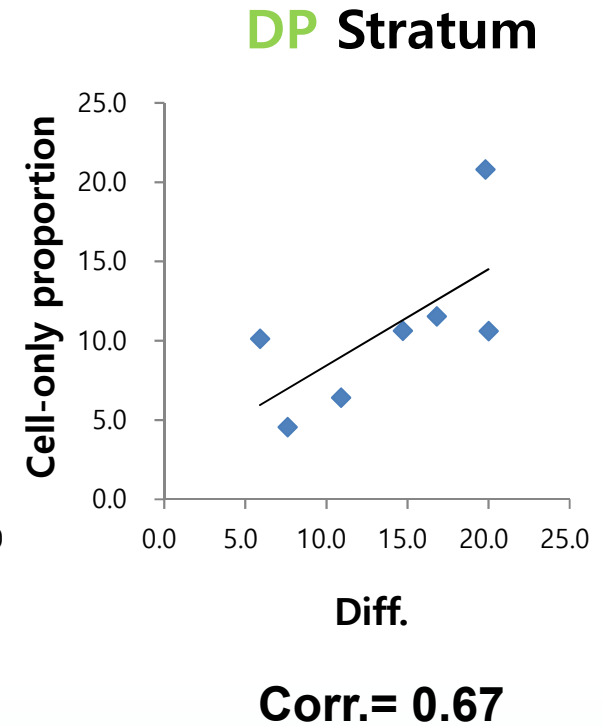
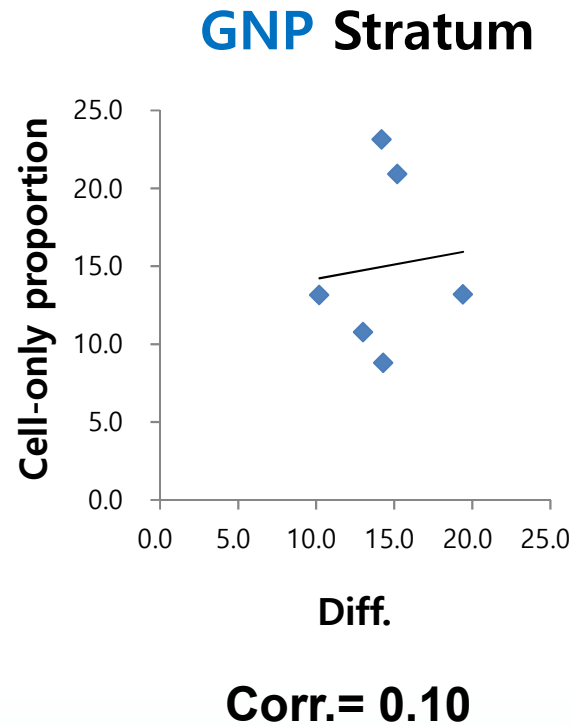
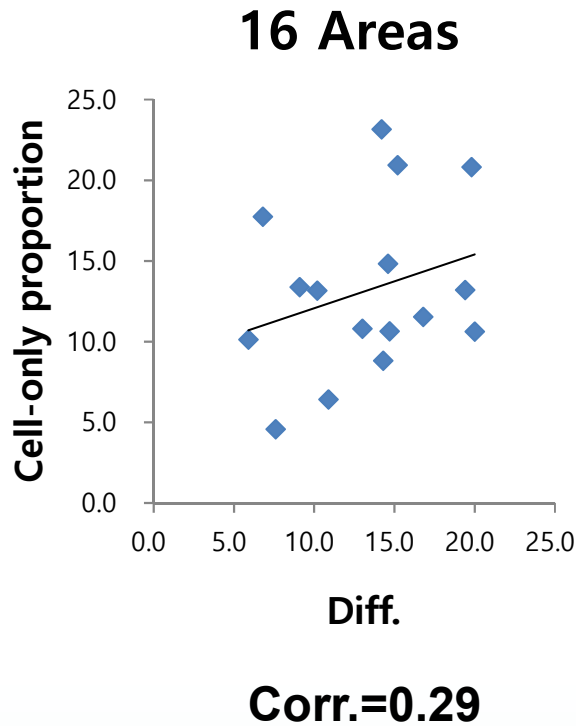
Other – 3 areas

Self-Report Voted for the Winner by Sample Frame

Geopolitical Strata	Listed Landline	Landline RDD	Cell RDD	Dual RDD	Actual Result
GNP	54.6%± 8.7	53.9%± 6.0	48.5%± 6.0	49.9% ± 4.8	54.9%
Diff. (p.p.)	-0.3	-1.0	-6.4	-5.0	
DP	65.7%± 11.2	61.7%± 8.8	61.8 %± 9.6	57.6% ± 7.7	56.4%
Diff. (p.p.)	9.3	5.3	5.4	1.2	
Others	59.9%± 19.1	49.9%± 13.7	50.8 %± 15.4	50.3%± 11.6	50.4%
Diff. (p.p.)	9.5	-0.5	0.4	-0.1	

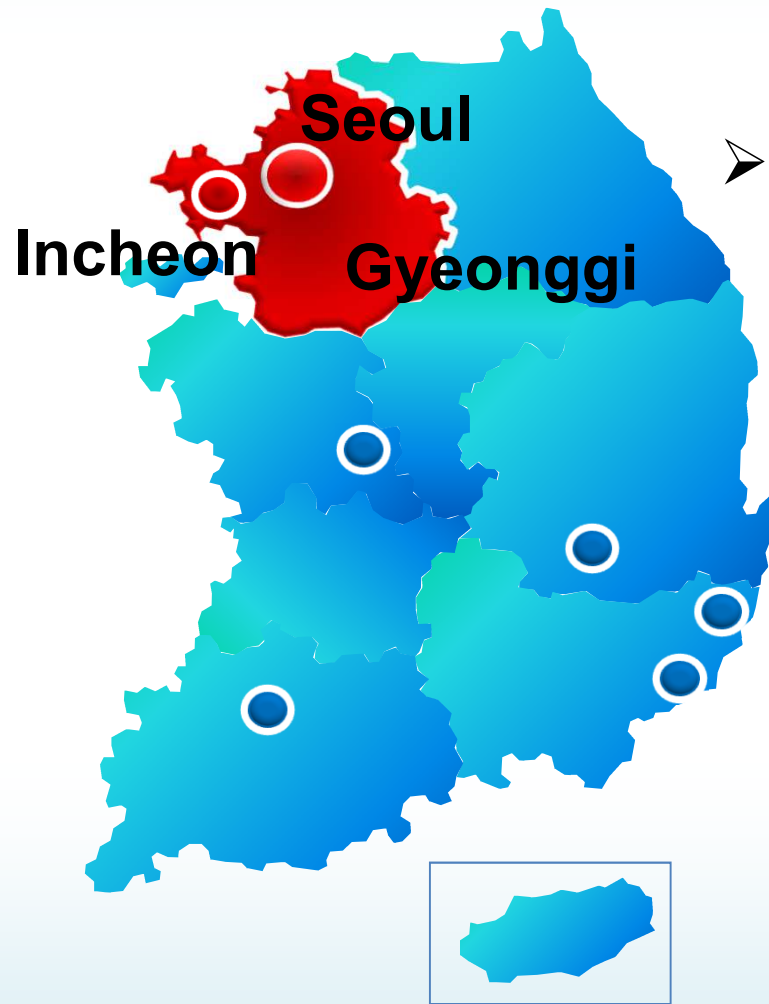
- **GNP: Underreported, especially for Cell RDD (Spiral of Silence)**
- **DP : Overreported (Social Desirability)**
- **Why is the Diff. in GNP small for ‘Listed Landline’ ‘or ‘Landline RDD’?
Answer: Does not depend on the coverage. See the next slide.**

Correlation Between Diff. in Pre-Election Polls and Proportion of Cell Only Population



Local Level

The Largest Metropolitan Areas: Seoul, Gyeonggi and Incheon



- Number of registered voters in 3 areas : 19,070,154 (49.1% of all voters)

Self-Report Voted for the Winner by Sample Frame

Seoul

Poll	Winner Party	Actual Result	5 Leading Media Groups (& Research Firms)					
			Poll A	Poll B	Poll C	Poll D	Poll E	Average
Pre-E.	GNP	47.4%	48.9%	46.7%	50.8%	50.4%	51.6%	
	Diff. (p.p.)		1.5	-0.7	3.4	3.0	4.2	2.3
Survey	Winner Party	Actual Result	Listed Landline	Landline RDD	Cell RDD	Dual RDD		
Post-E.	GNP	47.4%	55.1%±16.8	50.6%±10.8	41.8%±10.6	45.2%± 8.3		
	Diff. (p.p.)		7.7	3.2	-5.6	-2.2		

Self-Report Voted for the Winner by Sample Frame

Gyeonggi

Poll	Winner Party	Actual Result	5 Leading Media Groups (& Research Firms)					
			Poll A	Poll B	Poll C	Poll D	Poll E	Average
Pre- E.	GNP	52.2%	49.4%	46.5%	46.7%	44.7%	44.0%	
	Diff. (p.p.)		-2.8	-5.7	-5.5	-7.5	-8.2	-5.9
Survey	Winner Party	Actual Result	Listed Landline	Landline RDD	Cell RDD	Dual RDD		
Post-E.	GNP	52.2%	49.2%± 14.3	51.7%± 9.8	46.1%± 9.9	48.1%± 7.9		
	Diff. (p.p.)		-3.0	-0.5	-6.1	-4.1		

Self-Report Voted for the Winner by Sample Frame

Incheon

Poll	Winner Party	Actual Result	5 Leading Media Groups (& Research Firms)					
			Poll A	Poll B	Poll C	Poll D	Poll E	Average
Pre- E.	DP	52.7%	33.4%	34.4%	34.6%	32.9%	31.8%	
	Diff. (p.p.)		-19.3	-18.3	-18.1	-19.8	-20.9	-19.3

Survey	Winner Party	Actual Result	Listed Landline	Landline RDD	Cell RDD	Dual RDD
Post-E.	DP	52.7%	55.2%± 33.2	43.9%± 23.3	53.8%± 20.4	52.7%± 16.8
	Diff. (p.p.)		2.5	-8.8	1.1	0.0

Conclusions

- It seems that pre-election polls went all wrong due to errors of non-observation such as non-coverage, sampling error and non-response.
- The spiral of silence was likely to be activated in pre-election polls. But the errors due to the effect would be modest, relative to errors of non-observation.
- Using cell RDD only would not be beneficial to pre-election polls.
- Although 'Landline RDD' would comparatively work well in the GNP stratum or at some local levels, the best way to improve poll accuracy would be to use dual-frame RDD, because of representative sample characteristics.

Conclusions (Cont.)

- But we should be careful with response bias due to spiral of silence, especially in cell phone samples.

Thank you.

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