

통계의 기본 원리 및 응용

통계의 기본적인 활용 원리

- 문제의 제기
- 가설의 설정
- 자료의 수집
- 자료의 분석
- 결론의 도출
- 대안의 제시

질병의 창궐 (예: 콜레라)



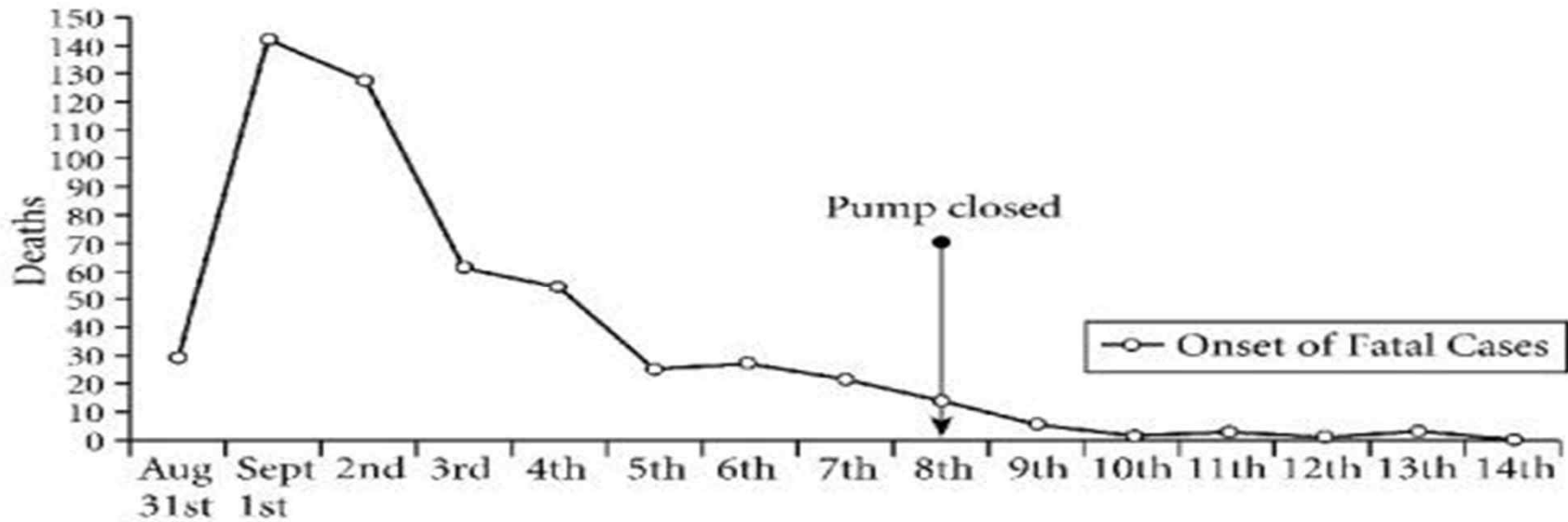
- 1차: 2만 명 사망
- 2차: 7만 명 사망

- 콜레라로 목숨을 잃은 환자의 집을 가가호호 방문하여 여러 질문을 하고 주변 환경을 관찰함
- 동일한 상황에서 콜레라에 걸린 사람과 걸리지 않은 사람의 차이를 비교
- 가설 수립 후 대규모 데이터를 모으고 콜레라의 발병과 관련되어 있을 것처럼 보이는 요인을 분석, 차이가 어느 정도 확실성이 있는지 검증

조사 결과

	가옥 수	콜레라 사망자 수	가옥 1만채 당 사망자 수
A급수펌프 이용	40,046	1,263	315
B급수펌프 이용	26,107	98	37

A급수 이용 차단 이후



(668 Deaths: Onset date unknown = 127)

전수 조사 vs. 표본 조사

- 교육부 조사: 대한민국 대학생의 키와 몸무게를 파악하기 위해 전수 조사를 하는 경우와 표본 조사를 하는 경우 어느 방법이 더 정확할까?
 - 모든 대학생이 직접 키와 몸무게를 재고 우체국을 통해 교육부에 우송
 - 임의 (무작위)로 뽑은 전체 대학생의 1% (약 2만 명)을 대상으로 표본 조사 실시

모집단과 표본

사례	모집단	표본
국의 간 맞추기	솔 전체의 간 정도	휘저은 뒤 국자에 담긴 국의 간 정도
대통령 후보에 대한 유권자들의 선호도 조사	한국의 모든 유권자	각 지역 시도별로 200명 씩 선정된 전화 설문 대상자
새로운 치료법에 대한 임상연구 대상 선발 및 적용	새로운 치료법을 적용 받을 수 있는 해당 특정 질병을 앓고 있는 모든 환자	새로운 치료법을 적용 받을 수 있는 특정 질병을 앓고 있는 환자 중 임상 연구의 조건에 따른 81명의 환자
공정에서 생산되는 부품의 품질 검사	공정에서 생산할 수 있는 모든 부품	무작위로 추출한 25개의 부품

루즈벨트 vs. 랜던

1—The American Institute of Public Opinion predicts the re-election of Franklin D. Roosevelt and John N. Garner.

Test Clashing Poll Methods

Is 55.7; New York in F.D.R. 'Sure' Column

Institute Forecasts the Re-election of Franklin D. Roosevelt, Gives Him 54% of Popular Vote, Minimum of 315 Electors

Major Party Percent Is 55.7; New York in F.D.R. 'Sure' Column

By GEORGE GARDNER
Director, American Institute of Public Opinion

NEW YORK, Oct. 15 (AP)—The Institute of Public Opinion, on the basis of its latest presidential poll, forecasts the re-election of Franklin D. Roosevelt and John N. Garner, with 54% of the popular vote and 315 electoral votes.

A confidential survey which indicates that in some states there may be a change in the composition of the electoral college, the Institute has estimated that 315 of the 531 electoral votes will be cast for the Roosevelt-Garner ticket.

The Institute's latest poll indicates that the Roosevelt-Garner ticket will receive approximately 54% of the popular vote, to 44% for Alfred M. Landon and Frank Knox. In 1932 the Roosevelt-Garner ticket received 54.7% of the popular vote.

With minor parties included, President Roosevelt's percentage of the total popular vote will be approximately 54%, to 40% for Landon.

The President will receive a minimum of 315 electoral votes. The number necessary to win is 267. Should last-minute shifts in the group of states where the race is nip-and-tuck give this entire group to Roosevelt, he would receive more electoral votes than in 1932, when he polled 472.

William Lemke, candidate of the Union Party, will poll fewer than 1,000,000 popular votes, and carry no state.

Norman Thomas, Socialist candidate, will poll about half as many votes as in 1932, when he received 824,000.




Election Forecast

- 1—The American Institute of Public Opinion predicts the re-election of Franklin D. Roosevelt and John N. Garner.
- 2—The Institute's latest presidential poll indicates that Roosevelt will receive approximately 54% of the major party vote (minor parties eliminated), to 44% for Alfred M. Landon and Frank Knox. In 1932 the Roosevelt-Garner ticket received 54.7% of the major party vote.
- 3—With minor parties included, President Roosevelt's percentage of the total popular vote will be approximately 54%, to 40% for Landon.
- 4—The President will receive a minimum of 315 electoral votes. The number necessary to win is 267. Should last-minute shifts in the group of states where the race is nip-and-tuck give this entire group to Roosevelt, he would receive more electoral votes than in 1932, when he polled 472.
- 5—William Lemke, candidate of the Union Party, will poll fewer than 1,000,000 popular votes, and carry no state.
- 6—Norman Thomas, Socialist candidate, will poll about half as many votes as in 1932, when he received 824,000.

Election Will Test Clashing Poll Methods

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240만 vs. 3천

	루즈벨트	랜던	N
다이제스트의 예측	43%	57%	240만
갤럽의 예측	56%	44%	3천
실제 선거결과	62%	38%	4,570만